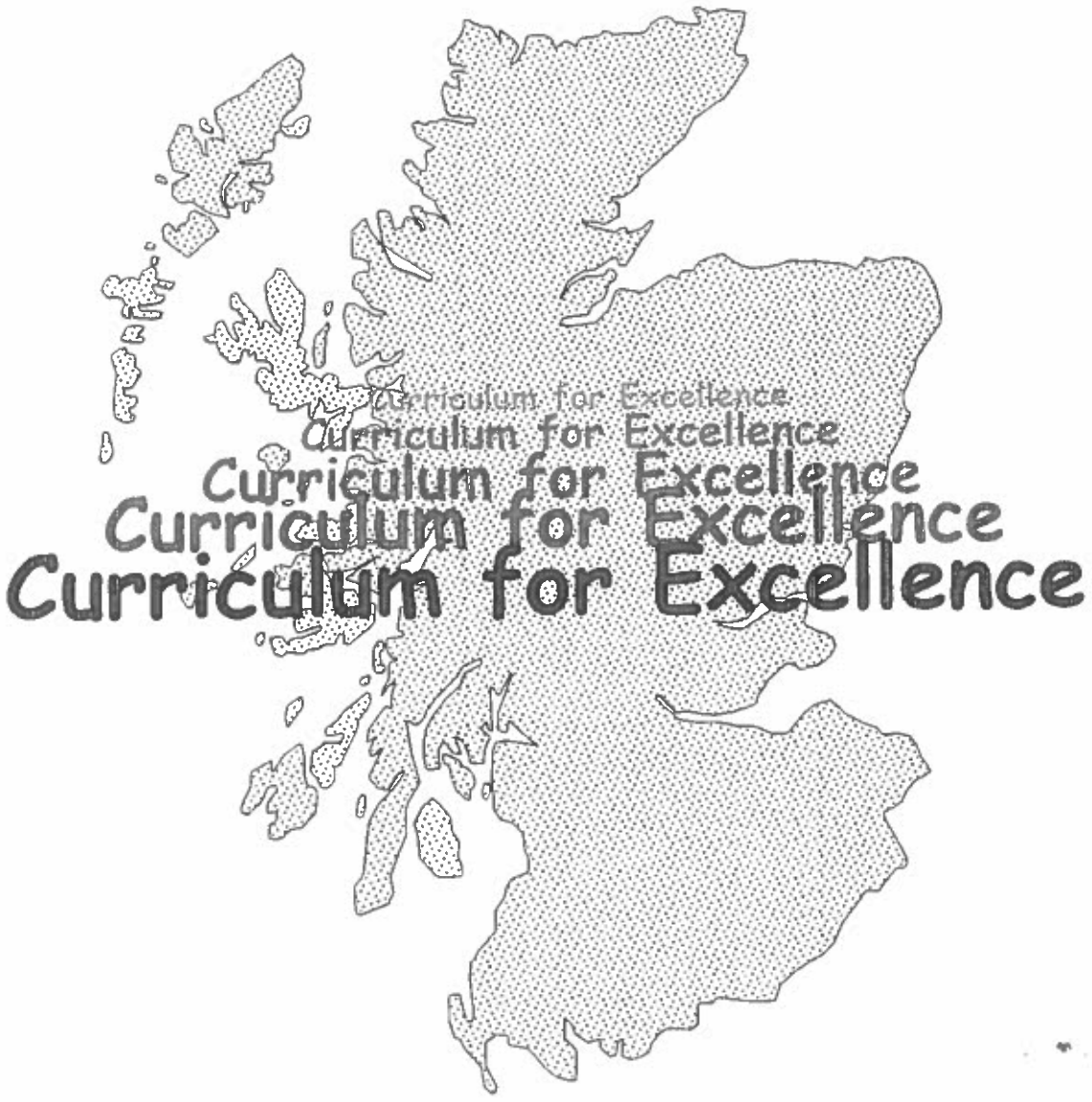
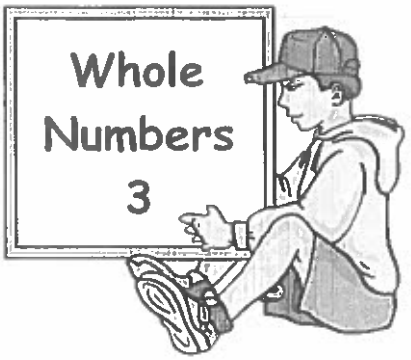
TeeJay Publishers

Book 2b



Homework

CHAPTER 1



Consolidation

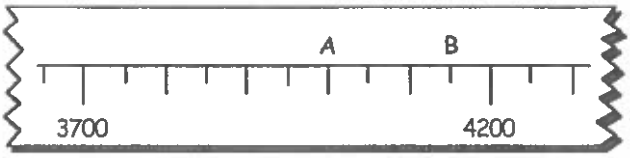
1. Write out the number 418 706 fully **in words.**

2. Write the number "sixty four thousand and seventy one" **using digits.**

3. Rearrange the numbers given below in order, starting with the **largest** :-

   49 138 49 318 50 112 48 992 50 120 48 979.

4. What numbers are represented by **A** and **B** on the given scale ?



5. What number lies **halfway** between 49 000 and 57 000 ?

6. Set down the following and calculate :-

   a $\begin{array}{r} 4719 \\ +\ 1582 \\ \hline \end{array}$ b $\begin{array}{r} 8436 \\ -\ 3762 \\ \hline \end{array}$ c 7908 + 682 d 5000 - 3693.

7. **Round** to the nearest **10** :- a 76 b 792 c 4887.

8. **Round** to the nearest **100** :- a 1472 b 8551 c 72 350.

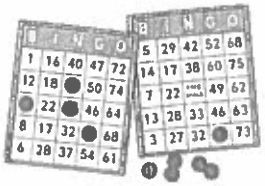
9. **Round** to 1 figure accuracy and find an **approximate** answer to 48 100 - 29 070.

10. Copy the following and complete the calculations :-

    a $\begin{array}{r} 9432 \\ \times\ 7 \\ \hline \\ \hline \end{array}$ b $4\overline{)19016}$ c 2647 x 9 d 5176 ÷ 8.

11. What is :- a 3162 x 10 b 603 x 100 c 39 100 ÷ 100 d 58 000 ÷ 1000 ?

12. A coach driver drives 286 miles each day, Saturday to Friday.
    How many miles does he cover in that time ?

13. 

    Nine people shared a bingo win of £3123.
    How much did they each receive ?

Exercise 1

1. What do the following **digits** stand for in the number 3 596 184 :-

   a 3 b 6 c 9 d 5 ?

2. What does the **5** stand for in each of these numbers :-

   a 47 530 b 48 251 c 935 200 d 5 680 703 ?

3. Write the following numbers out fully **in words** :-

   a 34 600 b 561 090 c 1 730 000 d 8 014 050.

4. Write the following numbers **using digits** :-

   a six hundred and forty thousand and eight

   b three million, nine hundred and twelve thousand

   c fourteen million, thirty thousand and seventy two.

5. Put the following set of numbers in order, **largest first** :-

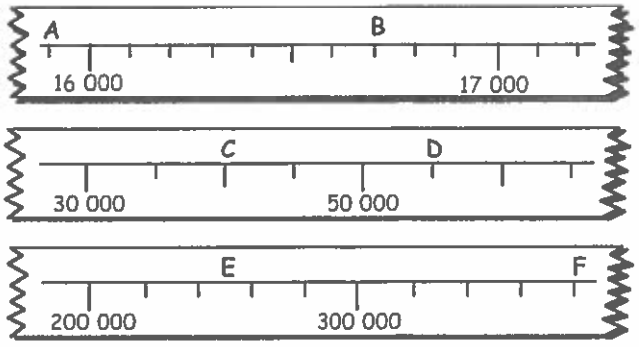
   100 460, 99 939, 100 064, 98 889, 89 988, 100 640.

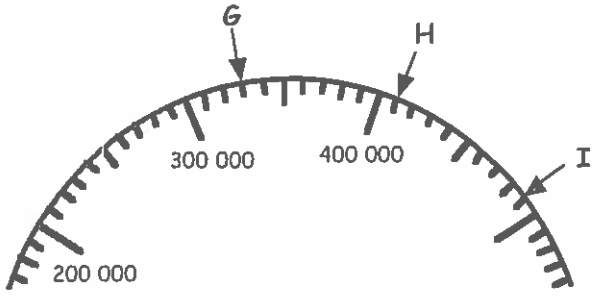
6. Write down the number that is :-

   a 60 **after** 480 b 90 **before** 1930 c 3000 **after** 177 003

   d 7500 **before** 800 000 e 400 200 **before** 2 100 600.

7. Look at the following scales. What numbers are represented by **A**, **B**, **C**, ... ?





8. What number lies **halfway** between :-

   a 4200 and 4800 b 52 000 and 52 900 c 900 000 and 1 300 000

9. Write out these **in figures** :-

   a $\frac{1}{2}$ million b $1\frac{3}{4}$ million c $2\frac{1}{4}$ million.

Exercise 2

1. Try to do the following **mentally** :- (*use the 2-step approach*)

   a 18 x 70 b 40 x 123 c 67 x 200

   d 312 x 800 e 3000 x 56 f 240 x 9000.

2. Calculate each of the following :-

   a 547 x 30 [Find 547 x 10 first = 5470 and then find 5470 x 3]

   b 4167 x 60 c 5674 x 80 d 9874 x 90

   e 3295 x 30 f 70 x 6047 g 36769 x 20.

3. Work out each of the following using the same 2 steps :-

   a 309 x 400 [Find 309 x 100 first = 30900 and then find 30900 x 4]

   b 463 x 300 c 700 x 408 d 900 x 748

   e 815 x 6000 f 8000 x 237 g 7000 x 6870.

4. Do the following **mentally** :-

   a 40 x 500 b 200 x 800 c 3000 x 9000

   d 24000 ÷ 400 e 5600000 ÷ 800 f 21700000 ÷ 7000.

5. There are 86400 seconds in an hour. How many seconds are there in 50 hours ?

Exercise 3

1. Round to the **nearest 10** :-

   a 79 b 293 c 7 d 705

   e 3766 f 8904 g 4097 h 14494.

2. Round to the **nearest 100** :-

   a 798 b 419 c 7610 d 8463

   e 23291 f 26850 g 88249 h 47951.

3. Round to the **nearest 1000** :-

   a 5700 b 19160 c 83912 d 17502

   e 468499 f 384511 g 369708 h 299981.

4. It cost Real Madrid £79 452 000 to buy Ronaldo.

   Round this amount to the nearest :- a £million b £10 million.

Exercise 4

1. Round each number to **1 figure accuracy**, then give an estimate for :-

a	81 x 38	b	47 x 62	c	98 x 51	d	496 x 62
e	308 x 89	f	875 x 193	g	496 ÷ 53	h	4038 ÷ 36
i	5874 ÷ 189	j	643 657 ÷ 313	k	19 076 ÷ 379	l	98 808 ÷ 4865.

2. a This bottle of tomato sauce weighs 712 grams.

What is the **approximate** weight of a carton containing 24 bottles ?

b 

A computer company made £27 324 on selling 195 notebooks.

Approximately, what were each of them sold for ?

c On average, a lorry driver travels 41 875 miles per year while at work.

If a haulage company employs 209 drivers, what will the **approximate** total mileage travelled by these drivers be ?

Exercise 5

1. The seating capacity of the Pavillion Theatre in Glasgow is 1449.

If it was filled to capacity on 230 occasions last year, how many people attended the Theatre in total ?

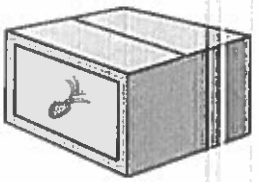
2. A shop bought in five thousand nine hundred and fifty Easter eggs.

If an equal amount were sold over a fortnightly period, how many eggs on average were sold each day ?

3. 

A box holds 280 locks. A double glazing company ordered 30 boxes. 8195 locks were used when windows were renewed in a housing estate.

How many locks did the company have left ?



4. A greengrocer bought 50 boxes of pineapples for £675. He sold them for £19·30 per box.

a How much money did he collect when he sold all the boxes of pineapples ?

b How much more was this than he had paid for them ?

5. 

Jennifer receives a monthly wage of £2445·80.

Marjorie gets paid weekly at the rate of £565 per week.

Who has the larger annual salary and by how much ?

Exercise 6

1. Use **BOMDAS** to help you calculate :-

a	$12 + 9 \times 2$	b	$40 - 28 \div 4$	c	$30 - 18 \div 2 - 13$
d	fifth of $70 - 10$	e	$10 + \frac{1}{2}$ of 50	f	$15 - \frac{1}{4}$ of $20 + 4$
g	$8 \times 2 - 21 \div 3 + 6$	h	$7 \times 6 - 2 \times 9 + 20 \div 4$	i	$9 - \frac{1}{5}$ of $(50 - 20)$.

2. Find, showing two more steps each time :-

a	$7 + (18 \div 2)$	b	$54 \div (12 - 3)$	c	$5 \times (14 + 6)$
d	$200 \div (16 + 4)$	e	$6 \times (7 + 3) - 50$	f	$(6 + 3) \times (7 - 2) + 5$.
g	$25 - \frac{1}{8}$ of 40×5	h	$\frac{1}{3}$ of ($\frac{1}{6}$ of 18)	i	$((6 + 4) \div 2) \times 3 - 10$.

3. Copy each of the following and **insert brackets** to make each calculation correct :-

a	$8 + 3 \times 4 = 44$	b	$23 - 6 \times 3 = 5$	c	$20 + 8 \div 7 = 4$
d	$2 + 8 \div 2 \times 8 = 34$	e	$12 + 20 \div 10 - 7 = 7$	f	$6 + 4 \times 8 - 5 \div 2 = 15$.

Revision Exercise

1. a **Round** to the **nearest 10** :- (i) 59 (ii) 4783 (iii) 16 845
   b **Round** to the **nearest 100** :- (i) 238 (ii) 1570 (iii) 19 173
   c **Round** to the **nearest 1000** :- (i) 2647 (ii) 31 498 (iii) 456 502.

2. a **Round** both numbers to the nearest **10**, then **estimate** :- $478 + 296$
   b **Round** both numbers to the nearest **100**, then **estimate** :- $6391 - 2524$
   c **Round** both numbers to the nearest **1000**, then **estimate** :- $14\,760 + 5438$.

3. **Estimate** :- a 5376×9 b $20\,875 \div 7$.

4. The population of Wales in July of 2011 was 3 028 899.
   Round this number to the **nearest ten thousand.**

5. Set down these calculations and work them out :-

a	$18\,479 + 416$	b	$49\,103 - 34\,877$	c	1946×7
d	3958×4	e	$584\,538 + 126\,496$	f	$13\,875 \times 9$
g	$137\,905 \div 5$	h	$26\,328 \div 3$	i	$2\,480\,023 \div 7$.

6. Write down the answer to :-

a	540 x 10	b	762 x 1000	c	476 x 100	d	3000 x 1000
e	470 ÷ 10	f	27 500 ÷ 100	g	3 701 000 ÷ 100	h	6 108 000 ÷ 1000.

7. Find :-

a	126 x 30	b	78 x 200	c	537 x 500	d	115 x 8000
e	630 ÷ 70	f	20 300 ÷ 700	g	8 404 200 ÷ 900	h	2 320 000 ÷ 4000.

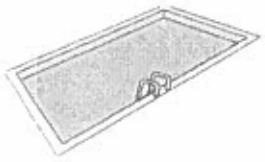
8. I flew from Edinburgh to Dubai, a distance of 5777 miles and then on to Shanghai, a further 6450 miles.

a How far did I travel in total ?

b How much shorter was the first journey ?

9. When a number is multiplied by 8 the answer is 69 992.

What is that number ?

10. 

The total amount of annual fees collected by the manager of a leisure centre consisting of 365 members was £153 300.

How much did each member have to pay annually ?

11. 48 people work an eight hour shift at a furniture store.

If the total wage bill for them is £2880, what is their **hourly** rate of pay ?

12. 

A buyer for a fashion store bought 80 jackets for £5200.

The store managed to sell all but 8 of them for £76 each.

a How much money did the store take in ?

b How much did the store make out of these sales ?

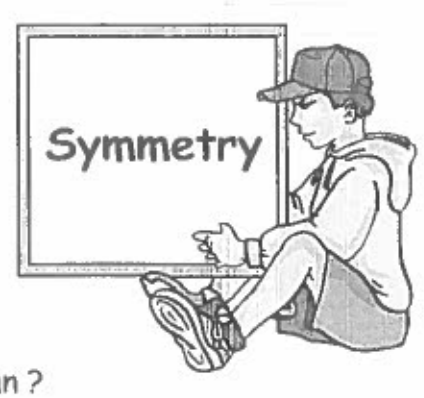
13. Mary bought a new sports car worth £43 750. She arranged to pay the dealer £7 000 and then pay what was still owed over a period of 24 months.

After that first payment :-

a how much did she still owe the dealer ?

b what had she to pay per month to clear what she owed ?

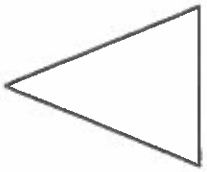
CHAPTER 2

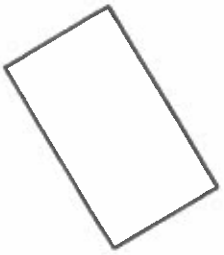


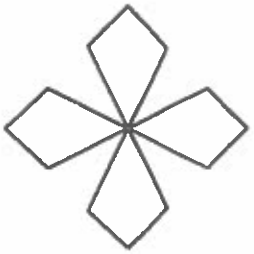
Consolidation

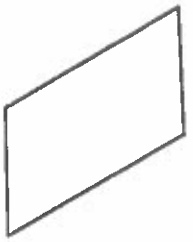
1. If a shape has **2 lines of symmetry** - what does this mean ?

2. How many lines of symmetry do each of the following shapes have ?

a 

b 

c 

d 

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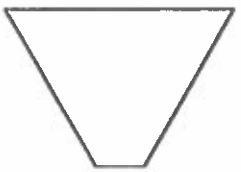
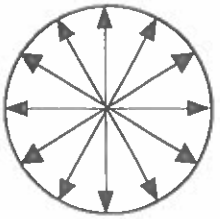
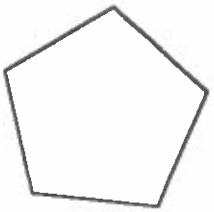
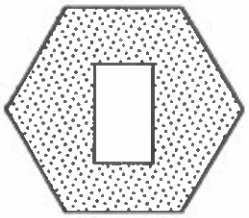
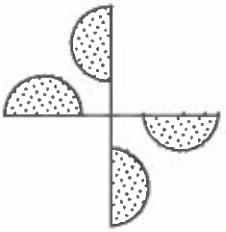
f 

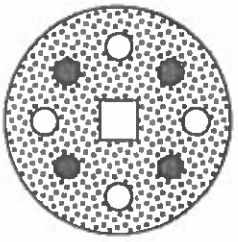
g 

h 

3. **Trace** or **copy** these shapes, neatly.

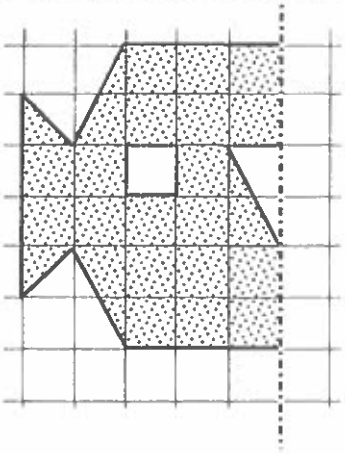
a 

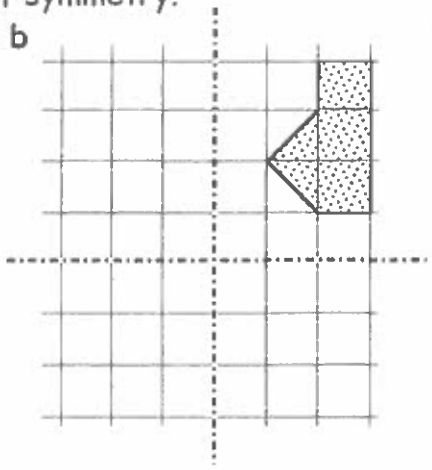
b 

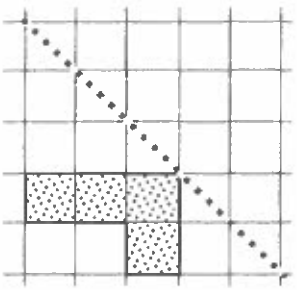
c 

Mark with dotted lines **ALL** the lines of symmetry.

4. **Trace** or **copy** the following shapes neatly onto squared paper and complete them so that the **thick** lines are lines of symmetry.

a 

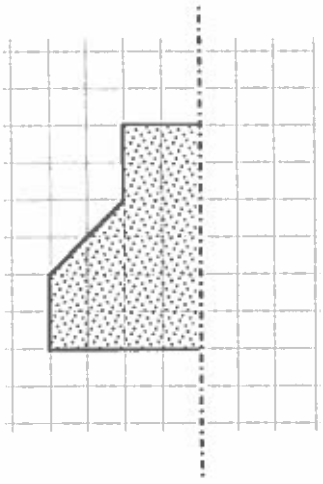
b 

c 

Exercise 1

1. **Trace** or **copy** the following shapes neatly onto squared paper and complete them so that the **thick** lines are lines of symmetry.

a



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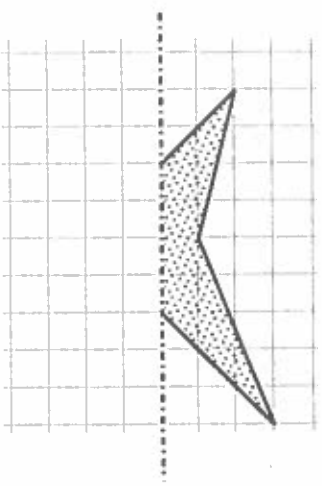

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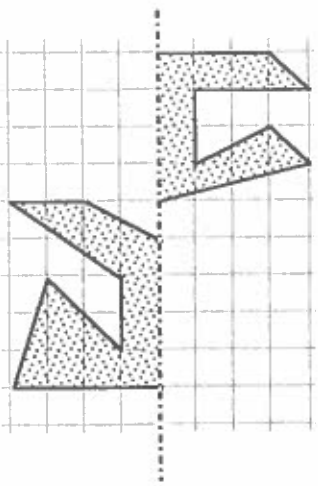

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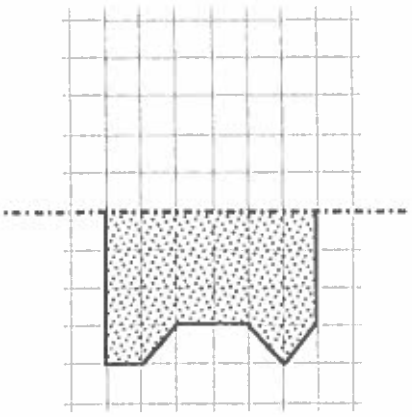

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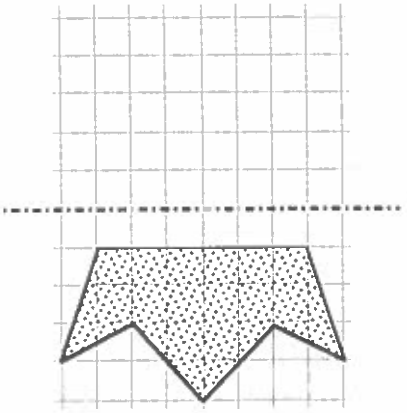

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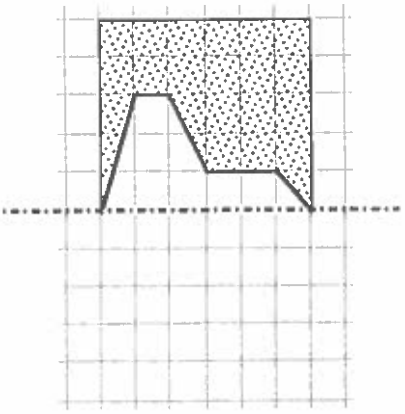

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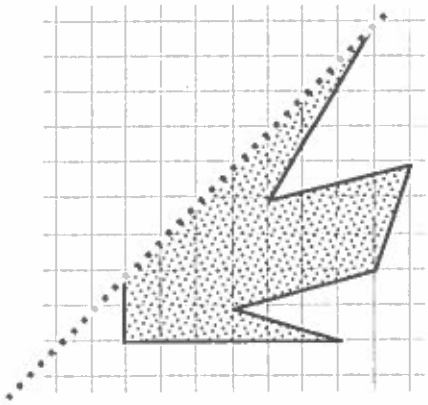

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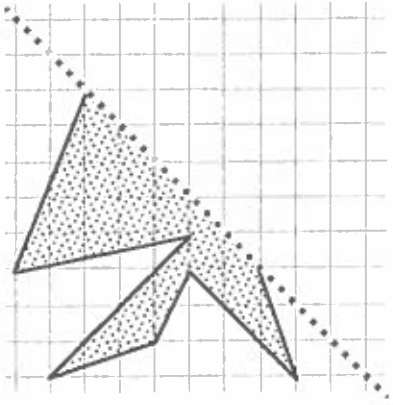

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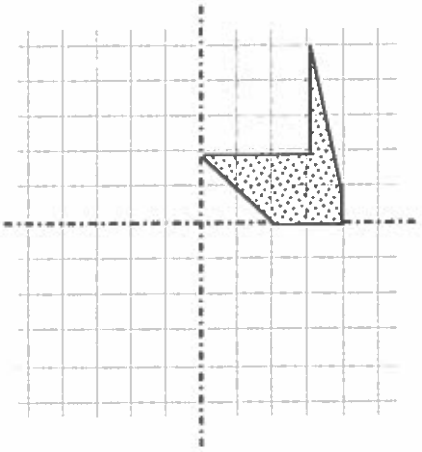
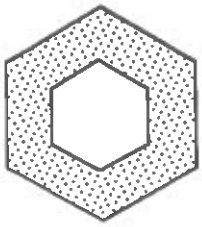
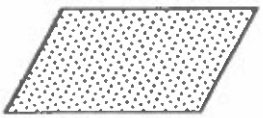
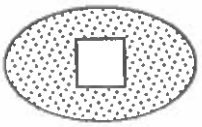


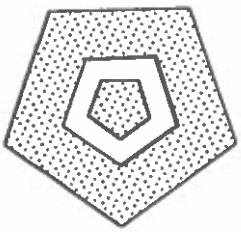
Revision Exercise

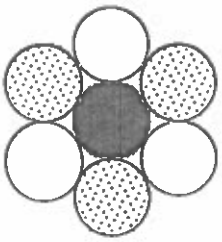
1. **Copy** or **trace** each of these shapes and draw in any lines of symmetry :-

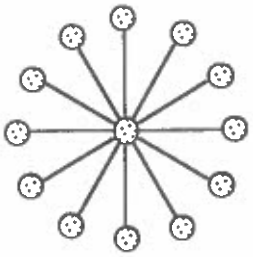
a 

b 

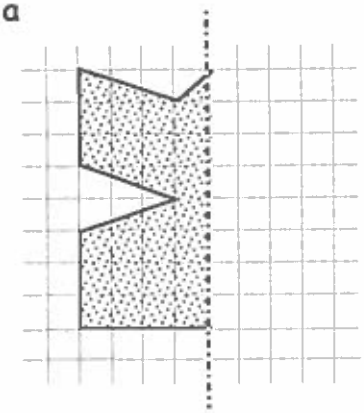
c 

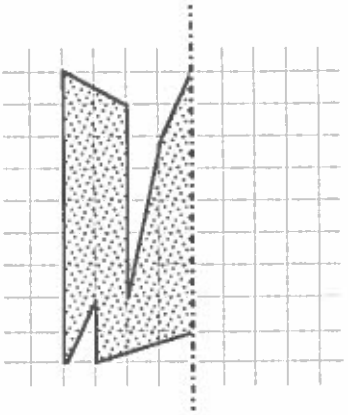
d 

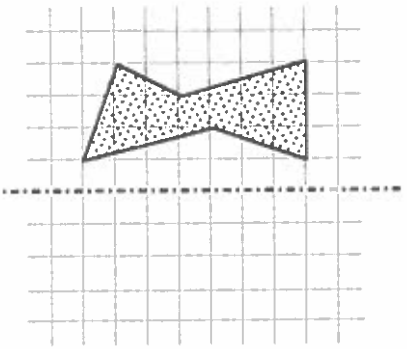
e 

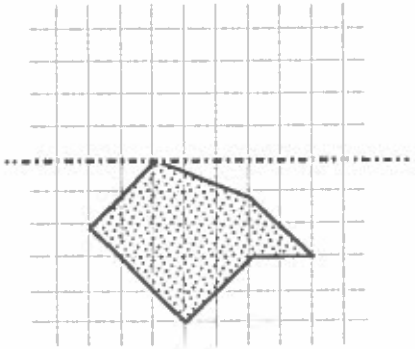
f 

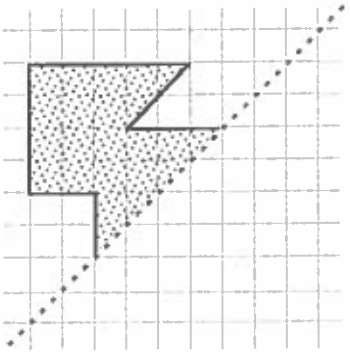
2. Complete each shape so that the thick line is a line of symmetry :-

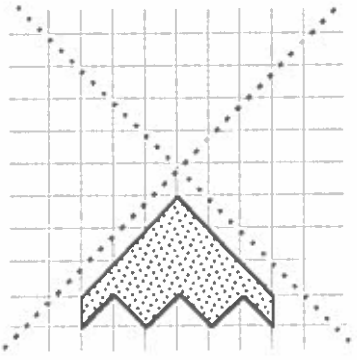
a 

b 

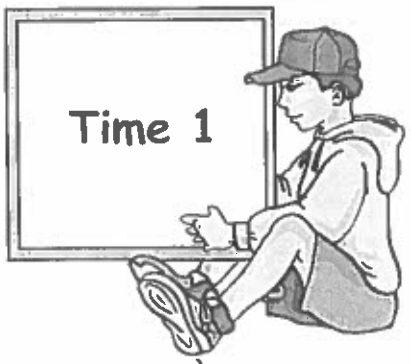
c 

d 

e 

f 

CHAPTER 3



Consolidation

1. Write the following in **12 hour format** :- (remember to use **am** or **pm**).

   a 0508 b 1735 c 1127 d 2250.

2. Change these times to **24 hour format** :-

   a 4.30 am b 9.09 pm c 20 to 11 at night d $\frac{1}{4}$ to 9 at night.

3. Jessie went shopping at 0935 and returned home at 1325.
   How long had she been at the shops ?

4. a How many days are there in :- **(i)** March **(ii)** June ?
   b How many days from 27th November until 12th December, **including** both dates ?

5. The film "Bad Insect" lasts for 2 hours and 14 minutes.
   "Poison Ant" runs for 1 hour and 57 minutes.
   How much shorter is the film "Poison Ant" ?

6. Russian time is 3 hours **ahead** of British time.
   This means that when it is 7 am here, it is 10 am in Moscow.
   I flew from Edinburgh Airport to freezing Moscow, leaving at 1150.
   If the flight took 2 hours 50 minutes, at what time (Moscow time), did I arrive at Domodedovo Airport in Moscow ?

Exercise 1

1. What time is it :-

   a 2 hours after 0840 b 3 hours 5 minutes after 1355
   c 4 hours 30 minutes after 10.30 am d 1 hour 10 minutes before 6.05 pm
   e 1 hour 30 minutes before 2350 f 6 hours 40 minutes after 1345
   g 2 hours 20 minutes after 2250 Monday
   h 5 hours 25 minutes before twenty to nine on a Tuesday night
   i 7 hours 7 minutes after 2053 on a Thursday ?

2. How long is it from :-

   a 3.15 pm to 8.15 pm

   b 20.45 to 23.20

   c 1325 to 2105

   d 5.30 pm to 10.20 pm

   e 2330 Wednesday to 0415 Thursday

   f 10.45 pm Friday to 6.30 am Saturday ?

3. Alan left home at 0755 and cycled to his office.
   It took him 1 hour 17 minutes to get there.

   Did he manage to make a 0900 start to his work ?

4. Ryanjet flight RY789 left Glasgow Airport at 2240 on Wednesday and arrived in Dalaman Airport, Turkey at 0325 (British time) on Thursday morning.

   a How long did the flight take ?

   b Turkey is 2 hours **ahead** of Britain.

   What time was it there when the plane landed ?

Exercise 2

1. Here is part of a train timetable for **"Glasgow to Aberdeen"** and **"Aberdeen to Glasgow"**.

Glasgow <—> Aberdeen				Aberdeen <—> Glasgow			
Glasgow	leave	0556	1741	Aberdeen	leave	0633	1830
Perth	arrive	0659	1843	Arbroath	arrive	0727	1924
	leave	0700	1844		leave	0728	1925
Carnoustie		0735	1928	Carnoustie		0734	1931
Arbroath	arrive	0742	1935	Perth	arrive	0812	2011
	leave	0744	1937		leave	0814	2013
Aberdeen		0844	2033	Glasgow		0915	2114

Write the following times in **12 hour time with am or pm** :-

   a When did the evening train from Aberdeen to Glasgow leave Arbroath ?

   b When did the evening train from Glasgow to Aberdeen pass through Carnoustie ?

   c For how long do all trains stop at Perth ?

   d On the morning Aberdeen to Glasgow train, how long is it from Aberdeen to Arbroath ?

   e On the morning Glasgow to Aberdeen train, how long is it from Glasgow to Perth ?

   f I am to catch the morning train from Aberdeen for a meeting in Perth at 8.30 am.

   If the train leaves Aberdeen late at 7 am, will I still make my meeting on time ?

Exercise 3

1. Change each of these to **minutes** and **seconds** :-

   a 83 secs b 134 secs c 212 secs

   d 360 secs e 900 secs f 730 secs.

2. Change each of these to **hours** and **minutes** :-

   a 75 mins b 145 mins c 265 mins

   d 470 mins e 1215 mins f 3000 mins.

3. Copy the following and complete :-

   a 2 mins 10 secs + 4 mins 35 secs

   b 8 mins 50 secs + 1 mins 40 secs

   c 5 hrs 45 mins + 4 hrs 45 mins

   d 7 mins 55 secs - 3 mins 10 secs

   e 7 mins 00 secs - 3 min 35 secs

   f 8 hrs 20 mins - 7 hrs 50 mins

4. Four girls ran in a 4 by 1000 metre relay race. Their times were :-

   - Jess - 2 mins 43 secs,
   - Ally - 2 mins 52 secs,
   - Sonya - 2 mins 27 secs,
   - Venus - 2 mins 37 secs.

   How long did their race last **altogether** ?

Exercise 4

1. Round the following times to **1 decimal place** :- (e.g. 5·87 secs —> 5·9 secs)

   a 9·62 secs b 27·158 secs c 9·97 secs.

2. Here are the times for the first 6 runners to finish a 400 metre race :-

   Roberts - 46·27 secs **Tomlie** - 47·26 secs **Hastie** - 45·98 secs

   Weir - 47·15 secs **Jonquin** - 46·09 secs **Kennan** - 46·90 secs

   List the 6 runners in order, **winner first**.

3. Look at the times on the two stopwatches.

   Which time is faster and by how many seconds ?

4. What race time (in minutes and seconds) is $\frac{7}{10}$ of a second **faster** than a time of 2 minutes 10·5 seconds ?

Revision Exercise

1. If 2235 is "twenty five minutes to eleven at night" :-
   Write out these times **in words** :- a 0851 b 2337.

2. Write the following in **12 hour format** :- (remember to use **am** or **pm**).
   a 0609 b 1845 c 1023 d 2240.

3. Change these times to **24 hour format** :-
   a 5.30 am b 8.07 pm c 5 to 11 at night d $\frac{1}{4}$ to 7 at night.

4. A ferry left Toff Island at 1134 and arrived at Port Aden at 1725.
   How long had it taken ?

5. Round to the **nearest second** :-
   a 13·7 secs b 49·48 secs c 1 min 14·25 secs d 51 min 50·5 secs.

6. Change the following into **minutes** and **seconds** :-
   a 72 secs b 130 secs c 202 secs d 375 secs.

7. Write these in **hours** and **minutes** :-
   a 86 mins b 150 mins c 193 mins d 423 mins.

8. Copy and complete :-

   a
   ```
     3 mins  25 secs
   + 6 mins  40 secs
   ```

   b
   ```
     5 hrs   35 mins
   - 1 hr    40 mins
   ```

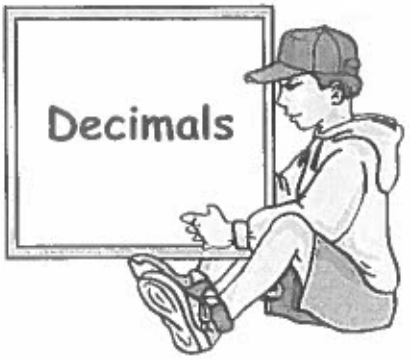
9. Here are the times taken by four boys to spell ten words :-
   - John - 24·57 secs
   - Jim - 23·95 secs
   - Thomas - 27·73 secs
   - James - 21·8 secs.

   Find the **total** time they took, answering in minutes and seconds.


Thomas

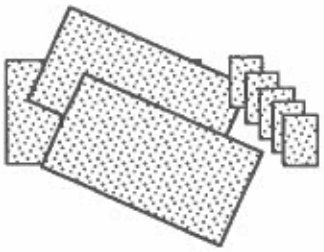
10. Burton's time for a practice lap is shown on this stopwatch.
    Alexi's time was 1 minute 22·85 seconds.
    a By how much did Alexi beat Burton ?
    b The fastest practice lap was done by Amaretto and was $\frac{7}{100}$ of a second faster than Alexi.
    What was Amaretto's time ?

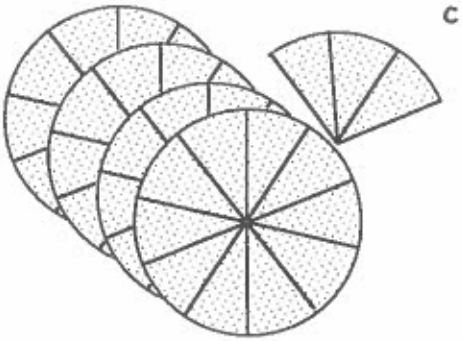
CHAPTER 4

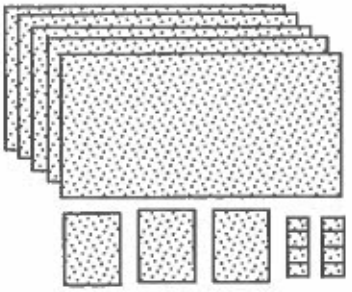


Consolidation

1. What decimal numbers do these diagrams represent ?

a 

b 

c 

2. What does the 3 represent in each of the following decimal numbers :-

a 243·716 b 4·035 c 0·3246 d 301·877 e 6·093 ?

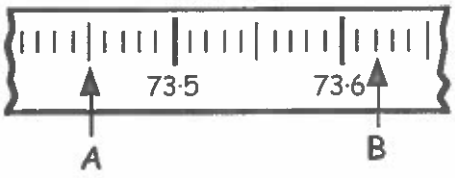
3. Arrange these decimal numbers in order, starting with the **largest** :-

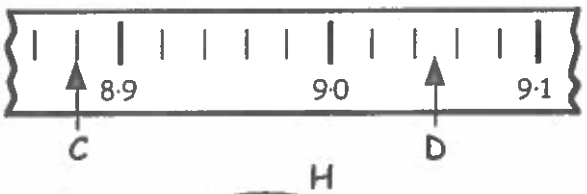
0·865, 0·856, 0·809, 0·79, 0·866, 0·709, 1·004.

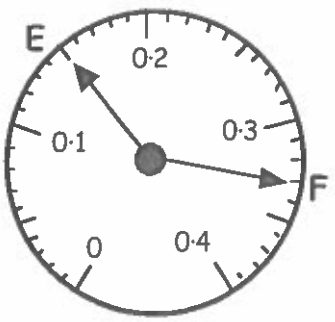
4. What number is :-

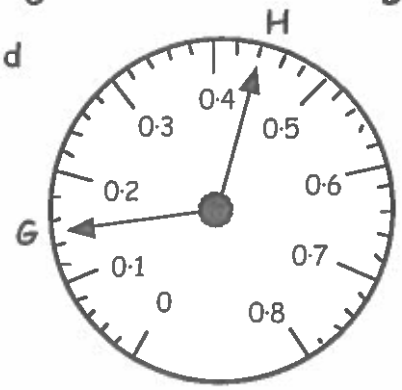
a $\frac{7}{10}$ **up** from 2·5 b $\frac{3}{100}$ **down** from 1·41 c $\frac{9}{1000}$ up from 6·921 ?

5. What decimal number is the arrow pointing to in each case :-

a 

b 

c 

d 

6. Round these to the **nearest whole £** :-

a £8·23 b £1·75 c £18·67 d £19·48.

7. Round these measurements to the nearest **whole centimetre** :-

a 6·4 cm b 9·7 cm c 8·47 cm d 23·15 cm.

8. Round these numbers to the **nearest whole number** :-

a 3·4 b 7·9 c 9·18 d 45·549.

9. Round these numbers to **1 decimal place** :-

a 2·34 b 4·917 c 12·49123 d 28·95112.

10. Round each number to **1 decimal place** and then find an **estimate** to :-

a 6·195 + 4·613 b 19·522 + 21·788 c 10·631 - 3·426 d 1·271 - 0·945

11. Round these numbers to **2 decimal places** :-

a 3·467 b 7·952 c 17·48808 d 56·53087.

12. Work out :-

a 19·7 + 11·3 b 6·84 + 7·6 c 0·865 + 0·98 d 19·3 + 2·578

e 609·87 + 92 f 4·8 - 3·9 g 19·5 - 14·2 h 58·7 - 30·8

i 1·47 - 0·5 j 67·3 - 45·91 k 7 - 0·072 l 2222 - 200·99.

13. Show your working in answering these questions :-

a A lawnmower full of grass weighs 17·5 kilograms.

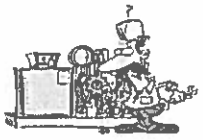
When the 0·75 kg of grass is emptied from it, what is the weight of the actual mower ?

b 

I cycle 12·8 miles from my house to the school.
Each day on the way home, I call in at my gran's which adds a further 1·95 miles onto my homeward journey.

How far do I cover to and from school each day ?

c A box of melons weighs 4·7 kg. What's the weight of 9 boxes ?

d 

Paul is a repair man and is paid daily.

What was his rate per hour when he received £98·88 for working from 7.45 am until 3.45 pm ?

14. Copy the following and complete the calculations :-

a 28·9 × 7 = _____

b 134·27 × 8 = _____

c 249·7 × 6

d 806·5 × 9

e $4\overline{)23{\cdot}6}$

f $6\overline{)47{\cdot}34}$

g 109·6 ÷ 8

h 1502·2 ÷ 7.

15. Write down the answers to the following :-

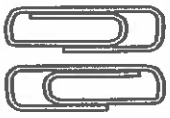
a 9·3 x 10	**b** 10 x 0·205	**c** 100 x 5·2	**d** 3·03 x 100
e 100 x 0·0086	**f** 2·817 x 1000	**g** 1000 x 4·0404	**h** 62·01 x 1000.

16. There are 1000 millilitres in 1 litre. How many millilitres are there in :-

a 2·447 litres	**b** 21·2 litres	**c** 0·8 litres	**d** 0·007 litres ?

17. Write down the answers to the following :-

a 25·7 ÷ 10	**b** 19 ÷ 10	**c** 0·98 ÷ 10	**d** 152·4 ÷ 100
e 19 ÷ 100	**f** 0·3 ÷ 100	**g** 500 ÷ 1000	**h** 26·09 ÷ 1000.

18. **a** 

The total weight of 100 paper clips is 97 grams.

What is the weight of 1 paper clip ?

b Sam paid £210·80 for 10 dwarf conifer trees.

What price were they each ?

c 

One thousand people each paid £25·50 for a football ticket.

How much did the club make from them in total ?

19. **a** Grego the Bakers charge £4·68 for their home made cherry sponges.

If they sold 8 of them within half an hour of putting them on display how much money did they collect in that short period ?

b 

A small dairy farmer collects roughly 29·25 gallons of milk each day from his 9 cows.

How many gallons of milk on average does each cow produce per day ?

20. Calculate, *using BOMDAS.*

a 5 + 6 x 3	**b** 45 - 6 x 7	**c** 4 x 5 - 12 ÷ 6
d 14 + 36 ÷ 9 - 17	**e** 64 - 56 ÷ 8	**f** 80 - 40 ÷ 10
g 23 - 15 + 6 - 12	**h** a quarter of 28 ÷ 7	**i** a sixth of 60 - 9
j $\frac{1}{2}$ of 30 ÷ 6	**k** 17 + $\frac{1}{3}$ of 21	**l** 26 - $\frac{1}{4}$ of 84 + 1
m 27 ÷ (7 - 4)	**n** 25 - 22 ÷ 11 - 23	**o** 9 x (7 + 1) ÷ 6.

Exercise 1

1. Find :-

a 4·25 x 20	b 26·4 x 30	c 5·72 x 40	d 37·8 x 50
e 61·27 x 60	f 219·4 x 70	g 325·09 x 80	h 0·04 x 90
i 0·073 x 200	j 10·97 x 300	k 0·0018 x 400	l 437·6 x 500
m 26·54 x 600	n 7·324 x 700	o 2·015 x 800	p 0·43 x 900
q 0·073 x 2000	r 10·98 x 3000	s 2·05 x 4000	t 5·128 x 5000
u 16·5 x 6000	v 100·1 x 7000	w 0·109 x 8000	x 0·0054 x 9000
y 0·003 x 10000	z 0·0004 x 20000.		

Exercise 2

1. Find :-

a 28·2 ÷ 20	b 108·9 ÷ 30	c 41·56 ÷ 40	d 287·5 ÷ 50
e 94·8 ÷ 60	f 28·0 ÷ 70	g 8·024 ÷ 80	h 0·27 ÷ 90
i 10·8 ÷ 200	j 20·7 ÷ 300	k 7·6 ÷ 400	l 5·05 ÷ 500
m 263·4 ÷ 600	n 7·322 ÷ 700	o 2·08 ÷ 800	p 0·45 ÷ 900
q 0·08 ÷ 2000	r 10·98 ÷ 3000	s 20·4 ÷ 4000	t 5·15 ÷ 5000
u 16·5 ÷ 6000	v 7000·7 ÷ 7000	w 0·032 ÷ 8000	x 0·0054 ÷ 9000
y 30 ÷ 10000	z 500 ÷ 20000.		

2. Find :-

a 544 ÷ 800	b 5·19 x 60	c 45·43 ÷ 70	d 327 ÷ 3000
e 1·27 ÷ 50	f 24·8 x 70	g 22·8 ÷ 600	h 84 ÷ 6000
i 129·9 x 80	j 0·432 ÷ 400	k 0·009 ÷ 90	l 0·0067 x 3000.

Revision Exercise

1. Write these numbers using **digits** :-

a seven hundred and nine

b eight thousand, two hundred and six.

2. Write these numbers in **words** :-

a 5306 b 19 004 c 147 800 d 7 895 010.

3. What does the **8** stand for in the number :-

   a 56 283 b 28 070 c 0·4289 d 2·84439 ?

4. Write the number that comes just :-

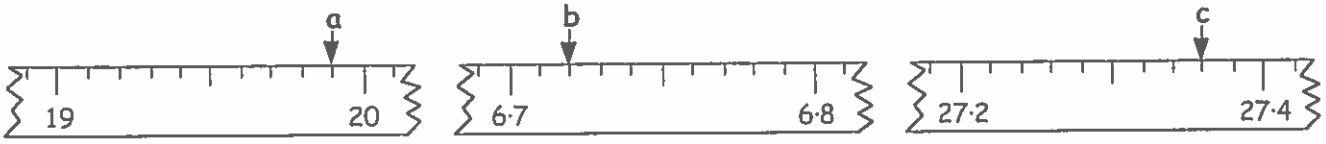
   a **before** 4080 b **after** 570 999 c **before** 900 000.

5. Rewrite each set of numbers in order. Start with the **largest** :-

   a 11 222, 9888, 9543, 10 989, 11 316, 10 898

   b 10·02, 10·98, 10·007, 10·088, 10·0915, 10·0177.

6. What numbers are the arrows pointing to ?



7. a Round to the **nearest whole number** :- (i) 48·5209 (ii) 8·4701.

   b Round to **one decimal place** :- (i) 25·76 (ii) 78·246.

   c Round to **two decimal places** :- (i) 12·1666 (ii) 0·9949.

8. Find :- a 6·8 + 5·7 b 15·2 - 8·91 c 19·7 x 3

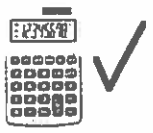
   d 18·32 ÷ 8 e 7·748 x 100 f 119·2 ÷ 10 g 173 ÷ 1000

   h 26·18 ÷ 20 i 2·3264 x 300 j 8·08 ÷ 40 k 0·32 x 2000

9. Find :- a 5 + 9 x 3 b 21 - 15 ÷ 3 c 10 + 12 ÷ 2 - 15

   d 9 x (11 - 5) e 30 - 21 ÷ 3 - 19 f $4 + \frac{1}{2}$ of (40 - 8).

You may use a calculator for Q 10.



10. a Cut a pipe 32·5 metres long into 13 equal sections.

    What length is each section ?

    b A 5 litre watering can is leaking 25 ml of liquid every second.

    How long until it is empty ?

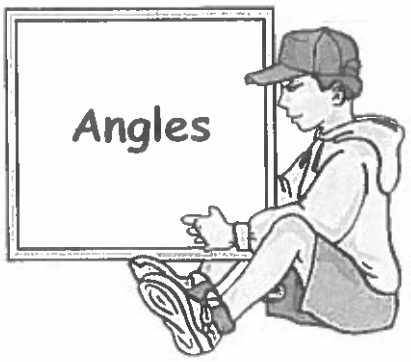
    c Thirty six 2·9 metre lengths of rope are laid end to end.

    What is the total length of rope ?

    d There are 17 cola cubes in a packet. Twenty packets are in a box. 150 boxes on a palette.

    How many cola cubes are on a palette ?

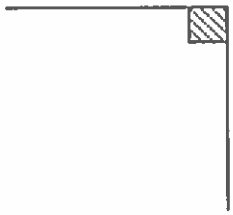
CHAPTER 5

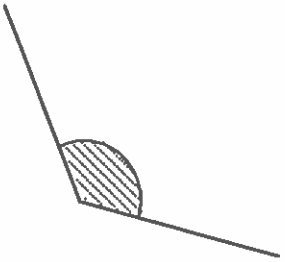


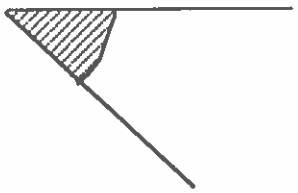
Consolidation

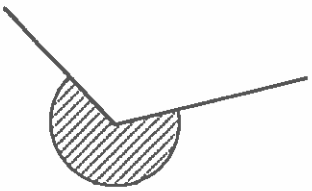
1. **Acute, Right, Obtuse, Straight or Reflex.**

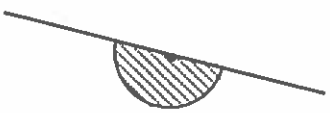
   What kind of angles are these ?

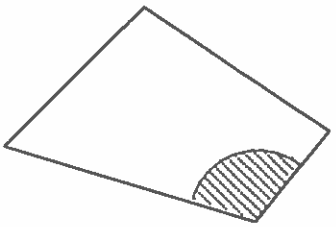
a 

b 

c 

d 

e 

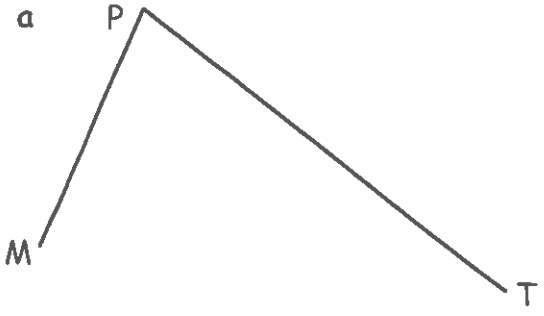
f 

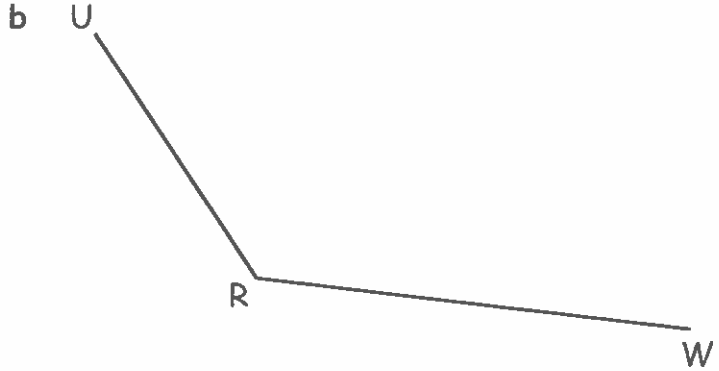
2. From the angles listed below, list which ones are :-

   a acute b obtuse c right d straight e reflex.

   56°, 129°, 90°, 186°, 4°, 299°, 94°, 172°, 180°, 79°, 166°, 61°.

3. Use 3 letters to name each angle and use a protractor to measure its size.

a 

b 

4. Draw each of the following angles and label them with their letters :-

   a ∠DEF = 40° b ∠KLM = 75° c ∠PQR = 130°.

5. How many degrees are there from :-

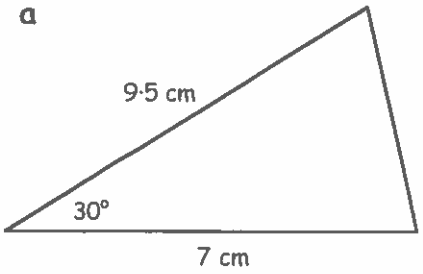
   a South to West (clockwise) b West to South East (clockwise)

   c South East to North (anti-clockwise) d North East to North (clockwise) ?

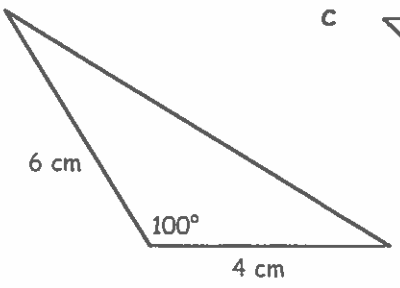
Exercise 1

1. Make accurate drawings of these triangles :-

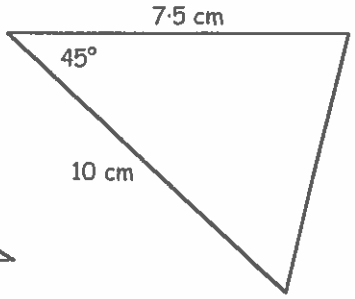
a



b



c

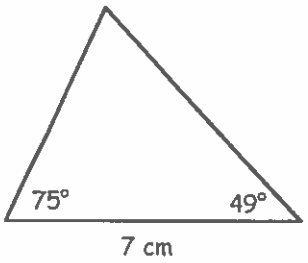


2. Draw ΔPQR where $QR = 9$ cm, $QP = 7$ cm and $\angle PQR = 35°$.

Exercise 2

1. Make accurate drawings of these triangles :-

a



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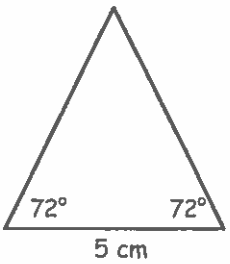
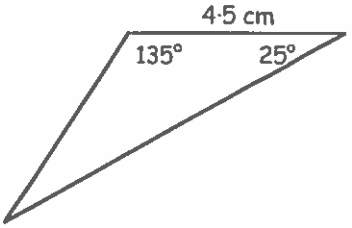


c

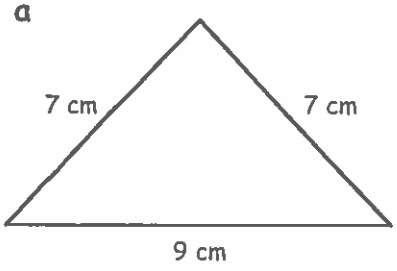


2. Draw ΔABC where $AB = 9$ cm, $\angle CAB = 50°$ and $\angle ABC = 45°$.

Exercise 3

1. Make accurate drawings of these triangles :-

a



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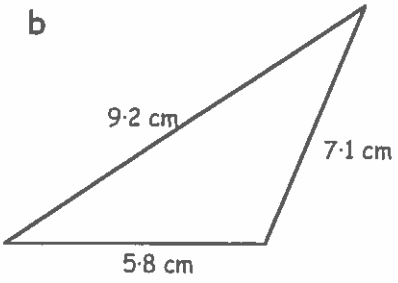

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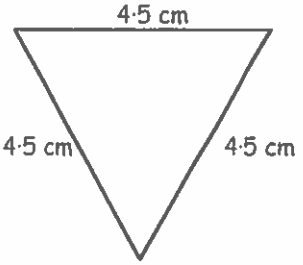
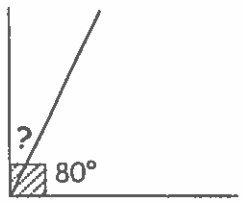


2. Draw ΔLMN where $LM = 8$ cm, $MN = 6$ cm and $LN = 4$ cm.

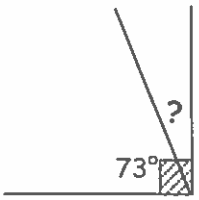
Exercise 4

1. Calculate the missing value in each of the following :-

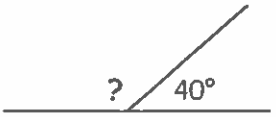
a



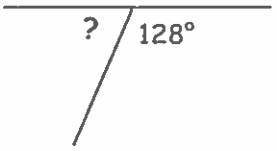
b



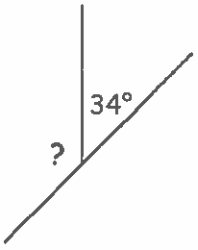
c



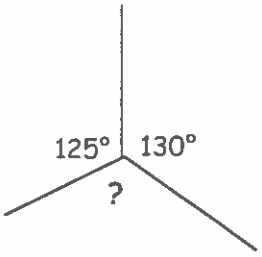
d



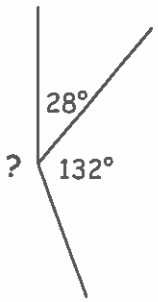
e



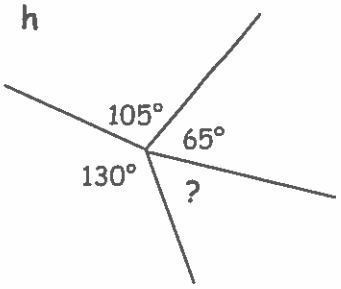
f



g



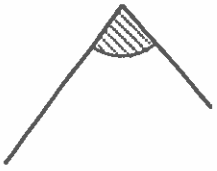
h



Revision Exercise

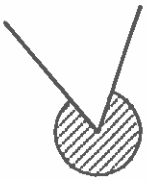
1. What **type** of angles are shaded ? **Acute, Obtuse, Right, Straight or Reflex** ?

a



b

c

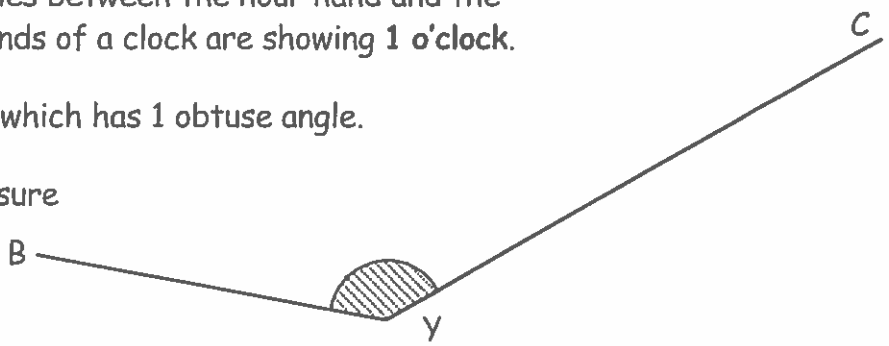


2. Draw a picture of what this pizza looks like after it has been given an **anti-clockwise quarter turn** around its centre.

3. Name the 2 **types** of angles between the hour hand and the minute hand when the hands of a clock are showing **1 o'clock**.

4. Draw a four sided shape which has 1 obtuse angle.

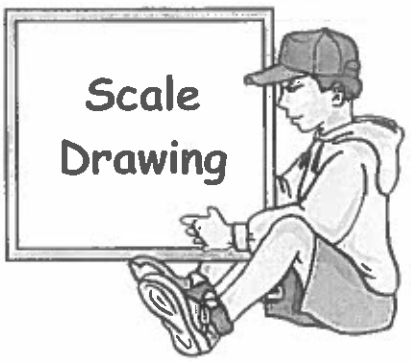
5. Name this angle and measure its size in degrees.



6. Draw a **right angled triangle** with two of its sides 3 cm and 4 cm.

7. Use a ruler and pair of compasses to draw an **equilateral triangle** with all three sides 8 centimetres long.

CHAPTER 6



Consolidation

1. How many degrees are there from :-

   a West to North (clockwise)
   b South to North (clockwise)
   c North West to West (anti-clockwise)
   d South to North East (clockwise)
   e SE to NE (clockwise)
   f W to SW (anti-clockwise).

2. a A coach was heading North West when it came to a roundabout.
   The driver turned his steering wheel through 45° anti-clockwise.
   In which direction was the coach then travelling ?

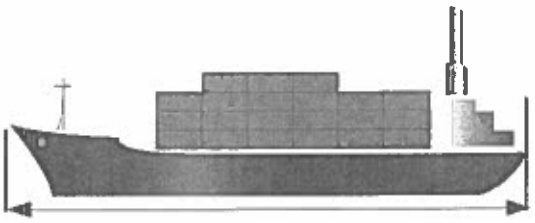
   b 
   A cargo ship was sailing North East.
   It then made a 90° turn anti-clockwise.
   In which direction was the ship now sailing ?

3. Use a ruler and protractor to draw an accurate diagram showing :-
   the path of a caterpillar crawling 6 cm NE, then 5 cm South, then 3 cm SW.

Exercise 1

1. The picture has been drawn using a scale :-

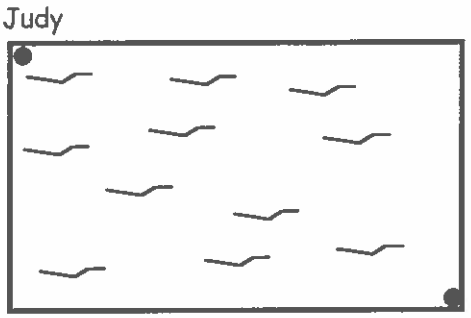
   1 cm = 10 m.



   a Measure the length of the ship.
   b Calculate the length of the **real** ship.

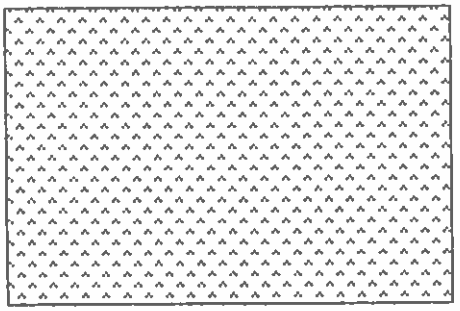
2. Shown is a scale drawing of a swimming pool.

   The scale is **1 cm = 6 m.**



   a Measure the length and breadth of the swimming pool.
   b Calculate the **real** length and breadth of the swimming pool.
   c Judy swims from one corner of the pool to her mum at the opposite corner of the pool.
   How far does Judy swim to reach her mum ?

3. A farmer's rectangular field is drawn on a plan.



The scale of the plan is **1 cm = 70 m.**

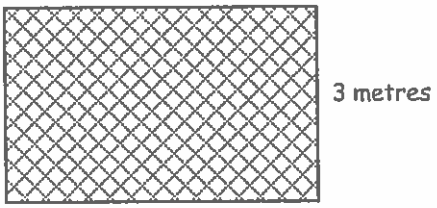
The length of the field on the plan is 10 cm.
The breadth of the field is four fifths of the length.

a Find the **real** length and breadth of the field, in metres.

b Calculate the **perimeter** of the farmer's field.

Exercise 2

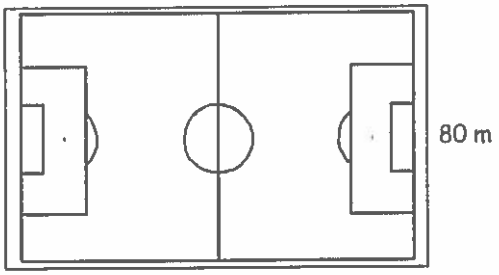
1. This is a plan of a tiled rectangular conservatory floor.



Make an accurate scale drawing of the room using a scale of :-

1 cm = $\frac{1}{2}$ metre.

2.



This is a sketch of a football pitch.

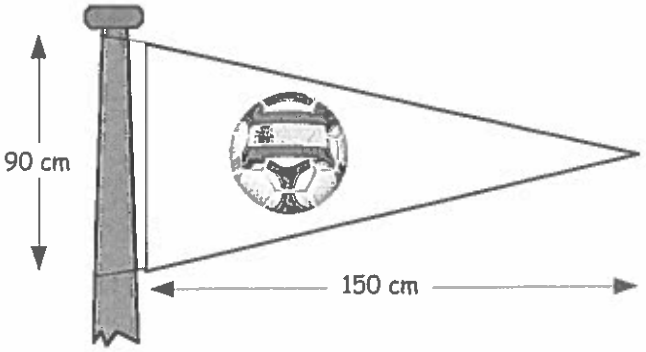
Make an accurate scale drawing of it using the scale :-

1 cm = 20 metres.

3. This triangular flag measures 90 centimetres by 150 centimetres.

Make a scale drawing of the flag.

Scale :- **1 cm = 30 cm.**

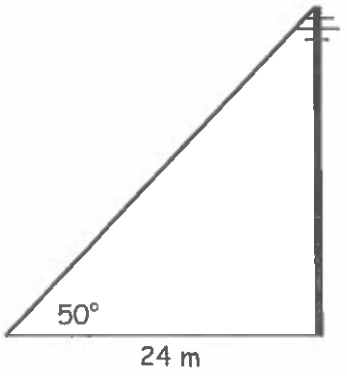


Exercise 3

1. a Use a ruler and protractor to make a scale drawing using the scale :-

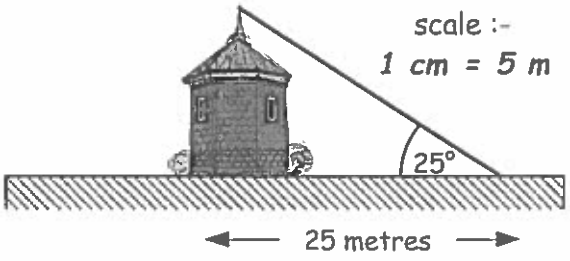
   1 cm = 4 m.

   b Calculate the real height of the telegraph pole, in metres.

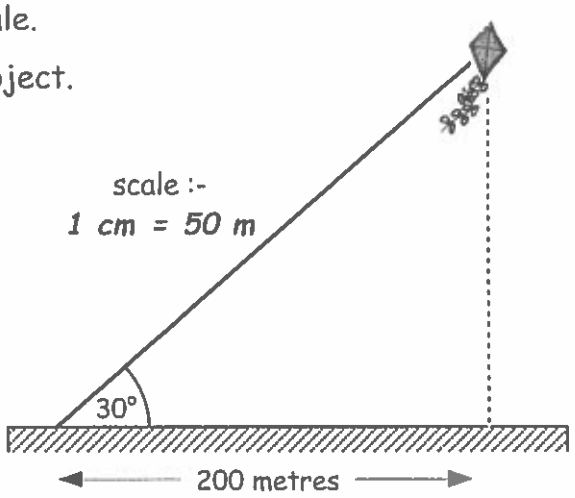


2. For each of the following,
   - Make a scale drawing using the given scale.
   - Calculate the **real** height of the given object.

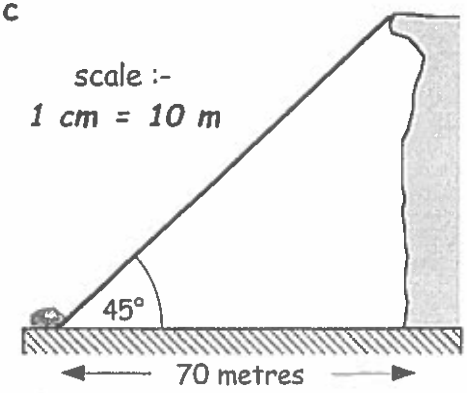
a



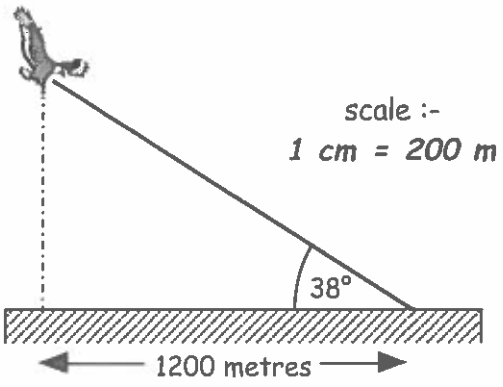
b



c



d



Exercise 4

1. Write each of the following compass directions as a **3 figure bearing** :-

   a West b South West c North West

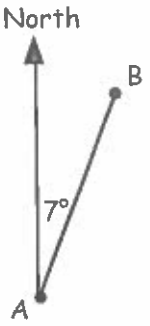
   d South e North f East.

2. Which compass point direction would I be heading on if I was travelling on a bearing of :-

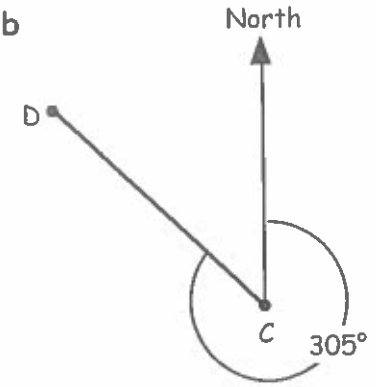
a 045° b 225° c 315° d 000°.

3. For each of the following directions, write down the **3 figure bearing** :-

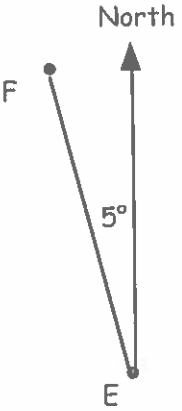
a



b



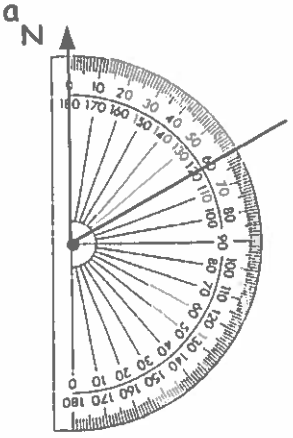
c



Exercise 5

1. Write down the 3-figure bearing for each of the following :-

a



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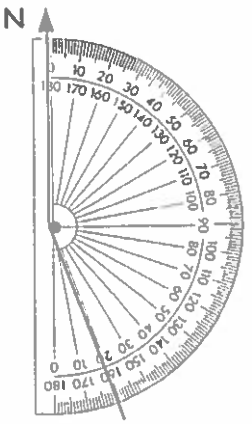
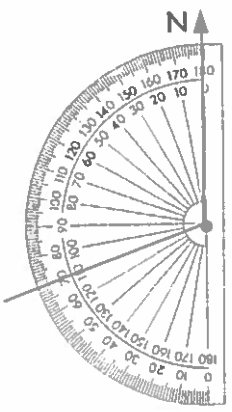
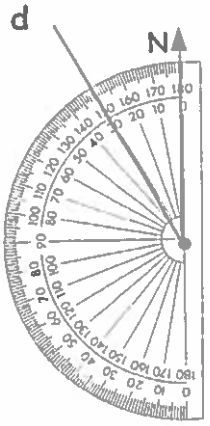


c

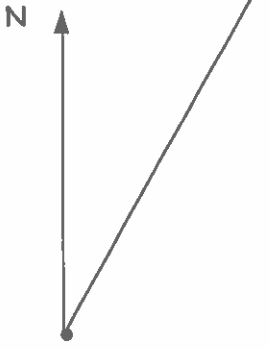


d

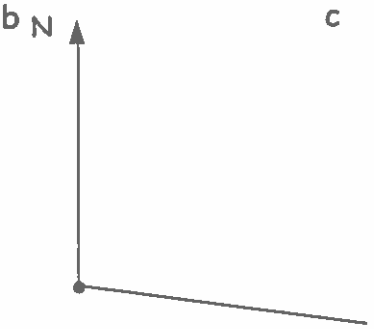


2. Using a protractor, write down the 3-figure bearing for each of the following :-

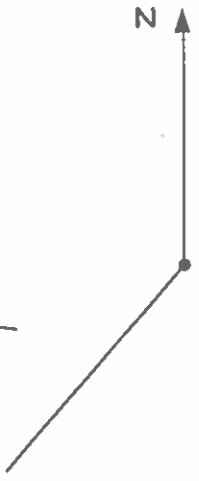
a



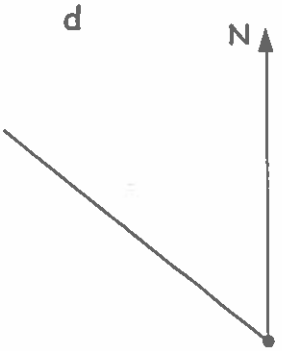
b



c



d



Revision Exercise

1. The scale on a map is given as :- **1 cm = 100 metres.**
   On this map the Brooklyn Bridge is 18·25 cm in length.
   Find the **real** length of the Brooklyn Bridge.

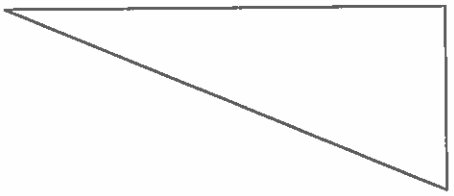
2. Make a scale drawing for each sketch below using the scales given :-

   a **1 cm = 5 cm**

30 cm

20 cm

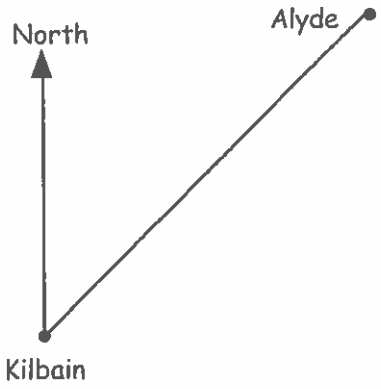
   b **1 cm = 15 km.**



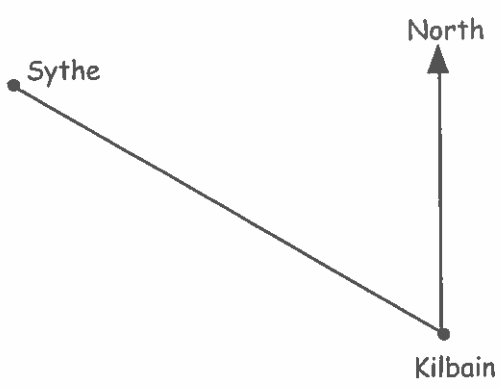
3. How many degrees **anti-clockwise** between :- a S and NW b SW and NE ?

4. Measure and write down the bearing of both towns Alyde and Sythe from Kilbain.

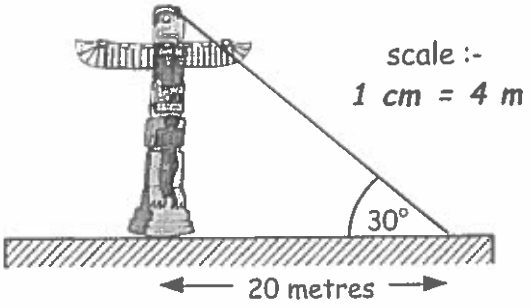
   a



   b

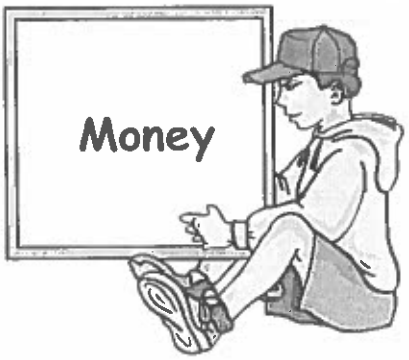


5. a Make a scale drawing of the diagram shown using a scale of 1 cm = 4 m.



   b Measure the height of the pole on your diagram and find its **real** height.

CHAPTER 7



Consolidation

1. Robert buys a new pair of trainers costing £28·99.

   He hands over **two** £20 notes.

   a How much change should Robert get ?

   b Give an example of what notes and coins he might get in his change.

2. Work out the answers to these :-

   a £26·74 + £8·89 b £48·06 - £19·17 c £8·37 x 7 d £27·76 ÷ 8.

3. Cup cakes can be bought in packs of 4 or packs of 6.

   The pack of 4 costs £2·32 and the pack of 6 costs £3·42.

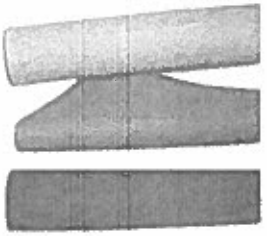
   Which is the **better** buy ?
   (*Explain your answer with working*)

You may use a calculator in the next question but must show your working.

4. Charlie bought new carpets for his house, costing £389 plus £78·99 to fit them.

   He put down £50·99 and paid off the remainder in 12 equal monthly instalments.

   How much did he have to pay each month ?



Exercise 1

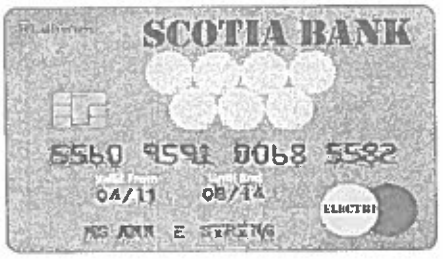
1. What does the banking term "ATM" mean ?

2. a Use the internet to find out where your nearest ATM is.

   b What services does an ATM provide ?

   c What are the advantages and dangers of using an ATM ?

Exercise 2



1. This card carries an APR charge of 36%
   i.e. you will be charged 3% interest every month.

   How much will Bushra owe after one month if she used her card to buy £150 worth of goods ?

2. Bushra's other credit card has an APR of 30%.

   How much would she owe after one month if she had used :-

   a £70 b £400 c £2300 ?

3.

Card	APR
Xemax	38%
Ariv	25%
Cobank	31%

Bushra is considering other credit cards as shown.

Are any of them better than the two she already has ? (*Explain why*).

Exercise 3

1. Jill saves £25 a week saving for a new fridge costing £295.

   Jan saves £30 per week for a new £366 oven.

   a Who will be able to buy their item first ?

   b By how many weeks ?

2. The Andersons save £75 every week, saving up for a weekend break costing £625.

   a How many weeks will they need to save to be able to afford the holiday.

   b After 6 weeks they notice another travel agent offers the same holiday at £499.

   For how many **more** weeks will they have to save ?

3. Alex decides to embark on a special svings scheme.

   At the end of week 1, he saves, £1. At the end of week 2, he saves £2. At the end of week 3, he saves £4. At the end of week 4, he saves £8 and so on....

   a How much will Alex have saved after 6 weeks ?

   b He has to pay £5000 after 12 weeks for a cruise. Will he have saved enough ?

   c What is the major problem with Alex's savings scheme ?

Exercise 4

1. I bought a game console for £39·50 and sold it on ebay a year later for £15·99.

   How much of a **loss** did I make ?

2. 

   Frank bought a flat for £88 500.
   He sold it two years later for £113 250.

   How much of a **profit** did Frank make ?

3. Venus bought two vases for a **total** of £1350.
   She sold one for £940 and the other for £710.

   How much profit did Venus make altogether ?


4. 

   Jamie bought a minibus for £8190.
   When he sold it a year later, he made a loss of £3870.

   For how much did Jamie sell the minibus ?

5. A shopkeeper bought a crate of 10 christmas trees for a **total** of £185.
   She sold **each** tree for £29·25.

   How much profit did she make altogether after selling all 10 trees ?

Exercise 5

1. Alice buys a £145 tennis outfit from a new sports catalogue.
   She is given an *introductory* **discount** of £15.

   How much does Alice pay for the outfit ?

2. 

   When Henry bought a £112 camera he was given an £11·20 **discount**.

   How much did he pay for his camera ?

3. Sammy bought a pack of lessons for £210. He was given a 10% **discount**.

   How much did he pay for his pack of driving lessons ?

4. Wilma bought four new tyres for a total of £472 and got a 25% **discount**.

   How much did she pay for the tyres ?

5. Cheryl and Dave paid £85·50 for dinner, which included a pre-theatre discount of £17·50.

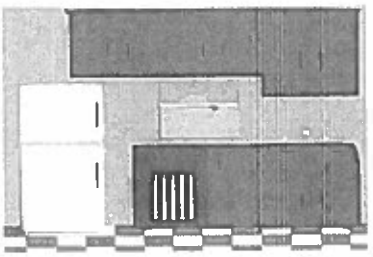
   How much was the original cost of the meal ?

Exercise 6

1. Helen bought a new TV by paying a deposit of £50 and followed this with 10 monthly payments of £30·50.

   a Calculate how much Helen paid in total using the Hire Purchase method.

   b How much **cheaper** would it have been if she had paid cash ?

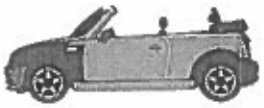
2. 

John was quoted £3220 to renew his kitchen units. He couldn't afford to pay cash so took out a Hire Purchase agreement.
His deposit was £200 and then 15 monthly payments of £220·80 each.

   a How much did it cost John for the new units ?

   b How much **more** was this than the cash price ?

3. Jason wanted to buy a new car which was priced at £8460. The salesman allowed him to make a deposit of £900 and pay the balance over 36 months at **no extra cost** !



   a After paying the £900 deposit, how much did Jason still owe ?

   b If he paid this evenly over the 36 months, how much did he pay each month ?

4. 

Beth bought her wedding dress for £2450.

She agreed to pay a deposit of £250 and pay the balance over 10 months at no extra charge.

   a After paying the deposit, how much did she still have to pay for her dress ?

   b How much did this leave her to pay each month ?

5. Bill has 3 ways of paying for his new £10 500 car.

   - If he pays cash, he will receive a 5% discount off the price.
   - If he takes out a bank loan over a year, he will pay 5% in interest.
   - If he takes out a hire purchase agreement, he has to make a deposit of £1050, followed by 18 monthly payments of £555.

   a Calculate the **difference** in the value between the dearest and the cheapest method of buying his car.

   b Why might Bill not automatically choose the cheapest method ?

Exercise 7

1. Addison flew to Italy and changed £350 to euros.

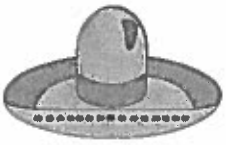
   How many euros did he receive ? (£1 = 1·23 €)

2. Betty changed £800 to euros before going for a week to Paris.

   How many euros did she get ? (£1 = 1·23 €)

3. The Johnstons changed £1200 to Rupees for their holiday to India.

   How many Rupees did they receive ? (£1 = 86·2 rupees)

4. 

   For our two week stay in Mexico, we took £1500 which we changed to Pesos.

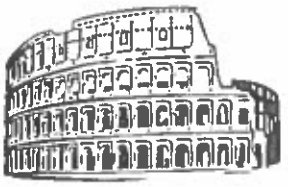
   How many Pesos did we get ? (£1 = 20·9 pesos)

5. Is it dearer to buy this camcorder in :-

   Scotland - £175 or Germany - 220 euros ? (£1 = 1·23 €)

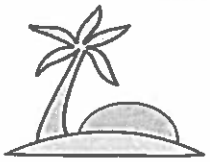
Exercise 8

(£1 = 1·23 €)



1. William returned from Rome with 92·25 euros.

   When he changed it back to £'s, how many did he get ?



2. Cindy came home from Tenerife with 12·3 euros.

   How much did she receive when she took it to the bank and exchanged it for £'s ?

3. Tony had £950 to spend on his holiday to Hong Kong.

   He spent 8060 dollars on sightseeing trips and 3900 dollars on food and drink.

   How many pounds did he have left ? (£1 = HK$13)

4. Kate took £1600 worth of dollars to the USA. (£1 = $1·60)

   She spent 1256 dollars travelling around, 486·70 dollars on a day trip to a theme park and 753·30 on presents.

   When she came home, she changed her dollars back into pounds.

   How many did she get ?

Revision Exercise

Qu 1 - 5 non calculator, Qu 6 - 9 calculator may be used

1. Shona had £185 to fill her freezer with butcher meat.

   She bought sirloin steak for £74·75, legs of lamb for £62·95 and spent the rest on pork chops.

   How much did she spend on pork chops ?

2. Which is the best buy here .... the 6-pack, the 8-pack or the 9-pack of Cola ?

£1·80

£2·32

£2·52

3. Alistair changed £500 into Euros at a rate of £1 = €1·21.

   How many Euros did he receive ?

4. George saves £18·50 every week for 8 weeks to buy a computer desk costing £185.

   How many **more** weeks will he have to save before he can afford the desk ?

5. Rod bought a new guitar for £235·65. He sold it soon after for £308.

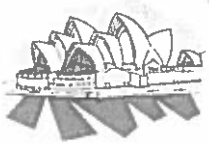
   What was his **profit** ?

---

6. Sadie changed £1800 into Australian dollars at a rate of £1 = $1·48. She spent $945 in Sydney and $1404 in Melbourne.

   a How many dollars did she have left ?

   b If she changed the remaining dollars back into £'s at a new rate of £1 = $1·50, how much would she receive ?



7. 

   Mr Gold bought 200 rings at £22·50 each.

   He sold 150 for £28 each but had to settle for selling the remainder at half price.

   He still made a profit - how much ?

8. Tulisa bought a van for £9600. A year later she sold it making a **loss** of 25%.

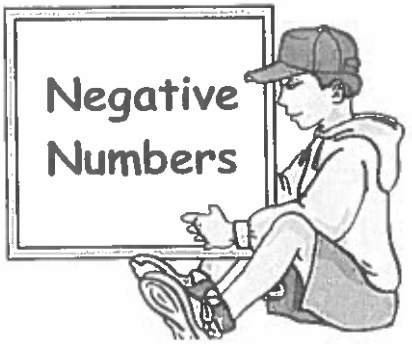
   How much did she sell the van for ?

9. A sweetshop owner buys 50 kg of Jelly Beans for £280. He then packs them into 200 gram jars.

   a How many jars can be made from the 50 kg ?

   b If he sells each jar for £1·70, how much **profit** can be made ?

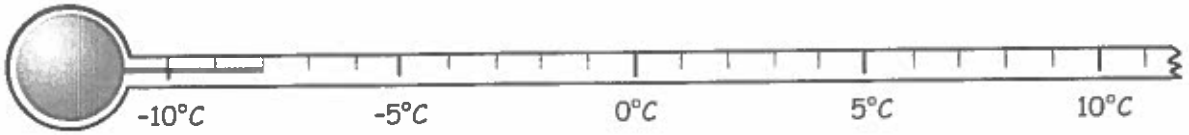
CHAPTER 8



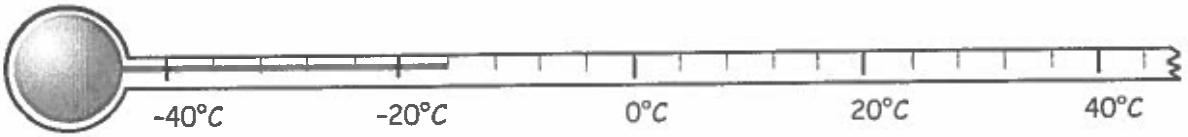
Exercise 1

1. What temperatures are shown below ?

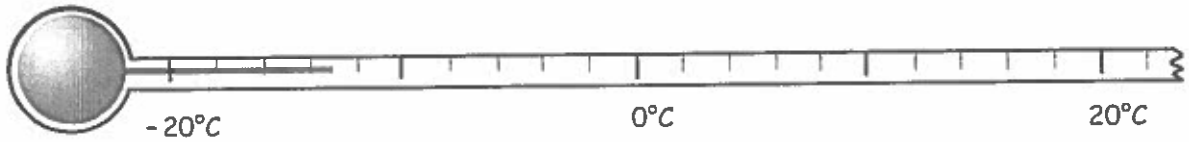
a



b



c



2. a Nicola's online banking account shows that she has (£310).

She withdraws £312 from the account. What will her balance show up as now ?

b Last month, Aaron's bank balance stood at (-£230·00).

He withdrew a further £75. What was his balance then ?

c Jed's online banking account shows that he has (£39·65). He buys a jacket with a debit card for £29·50 and signs a cheque for £12·35 to buy a tie.

He later goes on to his online account. What will his statement be showing ?

d Julia's balance last week was (-£72). She used her debit card for £90 on the same day as her monthly pay of £899 was paid into her bank.

What was her new balance ?

Exercise 2

1. What is the temperature that is :-

a	6°C up from 14°C	b	19°C up from 0°C	c	22°C up from 7°C
d	9°C down from 15°C	e	13°C down from 23°C	f	5°C up from -1°C
g	8°C down from -2°C	h	13°C up from -5°C	i	8°C down from 1°C
j	15°C down from 0°C	k	14°C up from -9°C	l	15°C down from -8°C ?

2. One winter's day in Peebles, the temperature was -7°C.

In Dingwall it was 5° colder.

What was the temperature in Dingwall ?

3. 

Whilst on holiday in Africa, I noticed the temperature fell from 41°C late morning to -7°C in the evening.

By how much had the temperature fallen ?

4. Write each set of temperatures in order, **coldest** first :-

a 9°C, -7°C, -19°C, 0°C, 7°C, -3°C.

b -31°C, -10°C, -18°C, -38°C, 1°C, -1°C.

Exercise 3

1. Write down each question first, then the answer :-

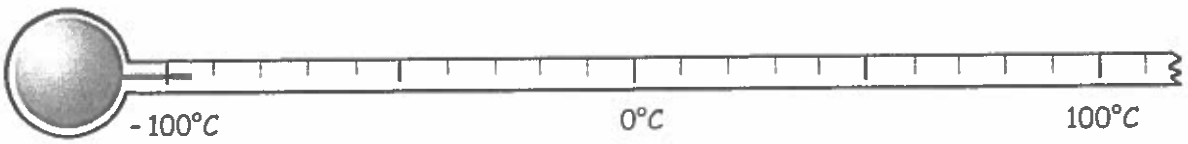
a	9 + 7	b	6 + 14	c	11 + 19	d	8 + (-6)
e	7 + (-6)	f	15 + (-14)	g	6 + (-9)	h	3 + (-11)
i	0 + (-17)	j	(-3) + 16	k	(-8) + 8	l	(-5) + 23
m	(-8) + 5	n	(-21) + 13	o	6 + (-19)	p	(-3) + (-16)
q	(-10) + (-10)	r	(-2) + (-16)	s	(-19) + 11	t	(-17) + 12.

2. Calculate :-

a	5 + (-2) + 4	b	5 + (-9) + 2	c	(-8) + 4 + 3
d	6 + (-9) + (-2)	e	(-5) + (-1) + 7	f	(-7) + (-4) + (-8)
g	4 + (-24) - 20	h	-200 - 400 - 600	i	4 + 6 + (-8) + (-12)
j	19 + (-21) + 7 + (-6)	k	(-2) + (-4) + (-9) + 15	l	90 + (20 - 30 - 40).

Revision Exercise

1. What temperature is shown below ?



2. Albert's bank balance last month was **(-£530)**.

His monthly wage of £1886 was then paid in, but he also paid his monthly TV/internet bill of £125.

What is Albert's new bank balance ?

3. 

Daisy had £190 in her bank account before the weekend.

She withdrew £80 on Friday night and £120 while shopping on Saturday afternoon. She deposited £35 on Monday morning.

Write down Daisy's new bank balance.

4. Find :-

a	7 + (-3)	b	12 + (-12)	c	(-1) + 11	d	(-4) + 13
e	(-15) + (-15)	f	(-6) + (-16)	g	(-25) + 27	h	(-102) - 103
i	(-1) - 8	j	-13 - 20	k	(-27) + 18	l	(-112) + 107
m	(-1) - 1	n	-25 - 5	o	(-19) + 27	p	(-106) + 109
q	(-200) - 100	r	-300 - 34	s	(-502) + 12	t	(-703) + 103.

5. The temperature at midday on a beach in Portugal was 36°C.
At midnight it had fallen to -4°C.

By how many degrees had the temperature fallen ?

6. 

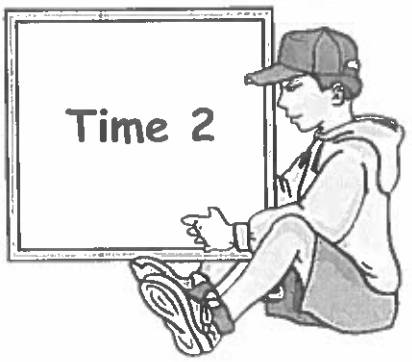
The coldest temperature ever recorded in England was -26°C. (Newport Jan. 1982).
The warmest recorded was 38°C (Gravesend Aug. 2003).

Calculate the difference in temperature.

7. Calculate :-

a	7 + (-9) + 2	b	5 + (-10) + 7	c	(-1) + 7 - 8
d	0 - 11 + 11	e	(-8) + (-6) + 12	f	(-13) + (-7) + 24
g	47 - 48 - 2	h	-23 - 9 + 31	i	-40 - 30 - 10
j	8 + (-7) + 9 + (-6)	k	(-1) + (-5) + (-7) + 18	l	(-8) + 4 + (-3) + 6
m	-2 - 5 + 3 - 11	n	-4 + 5 + 12 - 13	o	-21 + 30 - 20 + 8
p	18 + (-22) + 8 + (-7)	q	-2 - 6 - 8 + 11	r	-1 - 1 - 11 + 111
s	18 + (9 - 12 - 1)	t	50 - (20 + 10 - 25)	u	120 - (-80 - 20 + 110).

CHAPTER 9



Exercise 1

Teacher to decide

1. Calculate the distance travelled by a :-
   - a van, going at 40 mph for 5 hours
   - b train, travelling at 130 mph for 7 hours
   - c plane, doing 370 mph for 6 hours
   - d balloon, floating at 3 mph for 12 hours
   - e bus, moving at 65 mph for 4 hours
   - f rally car, doing 80 mph for 3 hours.

2. A plane left Portugal at 1555 and arrived in Glasgow at 1855. The plane flew at an average speed of 450 km/hr.

   How long did the flight take and how many kilometres did the plane cover ?

3. A ferry left Gourock at 1.30 pm and sailed at a steady speed of 16 mph along the River Clyde.

   How far was the ferry from Gourock at 4.30 pm ?

Exercise 2

1. Calculate the time taken for each of these journeys :-
   - a walking, 9 km at 3 km/hr
   - b running, 28 km at 7 km/hr
   - c flying, 3000 km at 500 km/hr
   - d driving, 600 miles at 50 mph
   - e skating, at 5 km/hr for 15 km
   - f crawling, 26 metres at 2 metres/second.

2. When will these vehicles arrive ?
   - a Train, leaves 10.30 am. Travels 550 miles at an average speed of 110 mph.
   - b Bike, leaves 1.45 pm. Travels 54 miles at an average speed of 9 mph.

3. A large jet left London's Gatwick Airport at 2230 on a Friday. Its destination was Cuba, 7500 kilometres away.

   If it travelled at a steady 750 km/hr :-
   - a How long did the journey take ?
   - b At what time and on what day did the plane reach Cuba ?

Exercise 3

1. Work out these average speeds :-

   a A liner travels 54 km in 3 hours
   b A cyclist covers 56 km in 4 hours
   c A runner does 400 metres in 4 minutes
   d A spider covers 4 metres in 1 minute
   e A girl hops 90 metres in 2 minutes
   f A bee covers 28 metres in 4 seconds
   g A bike travels 4 miles in 8 minutes
   h A jet flies 240 metres in 8 seconds.

2. 

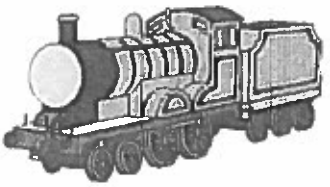
   A plane left Glasgow at 11.50 am and flew 2000 miles to Gran Canaria, arriving at 3.50 pm.

   a How long did the journey take ?
   b What was the plane's average speed ?

3. An old steam train picks up passengers and leaves Inverness at 9.45 am.

   It travels the 252 km to Edinburgh, arriving at 1.45 pm.

   a How long did the journey take ?
   b What was the average speed of the train ?



Exercise 4

1. An air ambulance lifted off from a hospital at 0742 and arrived at the scene of the accident at 1042.

   If the helicopter flew for 417 miles, what was its average speed ?

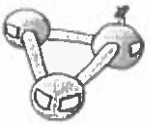
2. 

   An oil tanker travelled through 30 miles of shallow water at a slow speed of 5 mph.

   How long did it take the tanker to undertake this part of its journey ?

3. A communications satellite orbits a planet at an average speed of 9 720 mph, taking 4 hours to complete its orbit.

   Calculate the length of the orbit.



4. 

   A caterpillar moves at the slow speed of 8 centimetres per minute.

   At this speed, how long does it take the caterpillar to cross a lawn 1·6 metres wide ?

Revision Exercise

1. Due to a fire bell going off, the conference, due to end at 1545, did not finish until 1710.

   How long did it over-run ?

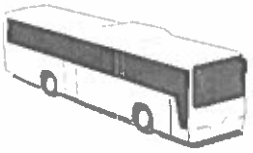
2. 

   China is 7 hours ahead of us.
   The Thomas family flew there to visit the Great Wall, leaving London Heathrow at 8.30 pm on a Friday.

   If the flight to China took 11 hours 25 minutes, on what day and at what time (China time) did they arrive there ?

3. A coach travelled 325 miles in 5 hours.

   What was its average speed ?



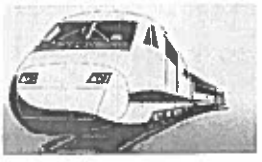
4. 

   Jess left her aunt's home in Glasgow and headed along the country roads, driving at a steady speed of 48 km/hr to her own house in Nairn, a distance of 288 km.

   How long did it take her ?

5. A train left Stirling bound for Cardiff.
   The journey took 4 hours, averaging a speed of 89 mph.

   How far is it by rail from Stirling to Cardiff ?



6. At full speed, a tortoise took 8 minutes to cross a cabbage patch, 4 metres wide.

   At what speed did he move, in **centimetres** per **minute** ?

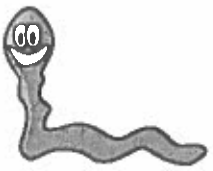
7. 

   A ladybird can cover 70 metres in half an hour.

   Calculate the average speed of the ladybird, in metres per hour.

8. It took a worm 250 minutes, slithering at 6 cm/min to squirm across a piece of ground.

   How far had it travelled, in metres ?

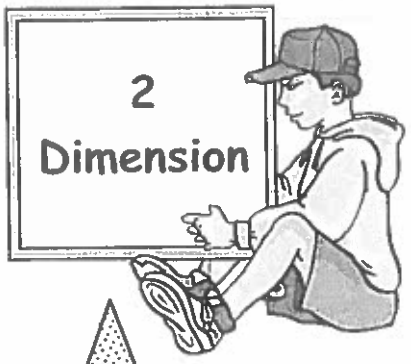


9. A marathon runner out training, set off at 2120 and ran for 15 miles through the countryside at an average speed of 10 mph, until he arrived back home.

   a How long did his training run last, in minutes ?

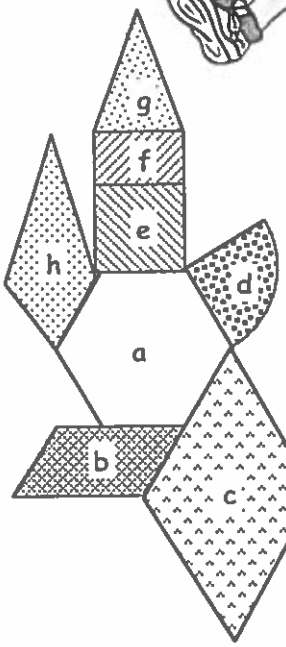
   b At what time did he arrive back home ?

CHAPTER 10



Consolidation

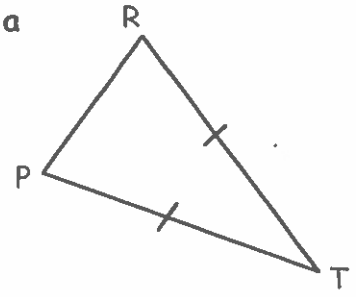
1. Name the eight mathematical shapes you can see in the figure shown opposite.



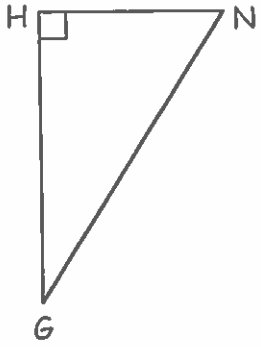
2. Using one description from each box, **name** and **describe** each of the triangles below fully.

scalene triangle isosceles triangle equilateral triangle	acute angled obtuse angled right angled

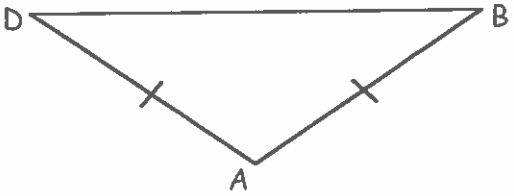
a



b



c



3. If a circle has a radius of 10·5 metres, what is the length of its diameter ?

Exercise 1

1. A **square** has quarter-turn symmetry. Write down **4** more properties for a square.
2. A square has length 8 cm. Calculate its :- **a** perimeter **b** area.

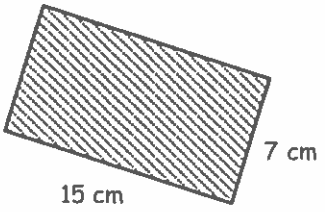
3. A square has perimeter 60 cm. How long are its sides ?
4. A square has an area of 100 mm^2. What is its **perimeter** ?

Exercise 2

1. A **rectangle's** diagonals bisect each other.

   Write down **four** more properties for a rectangle.

2. Calculate :- a the perimeter
   b the area of this rectangle.



3. Draw any rectangle with a perimeter of 18 cm.

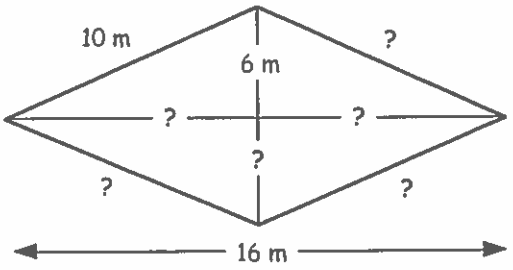
Exercise 3

1. A **rhombus** has four equal sides. Write down **four** more properties for a rhombus.

2. Make a neat sketch of this rhombus and mark in all the 6 missing lengths.

3. What is the perimeter of this rhombus ?

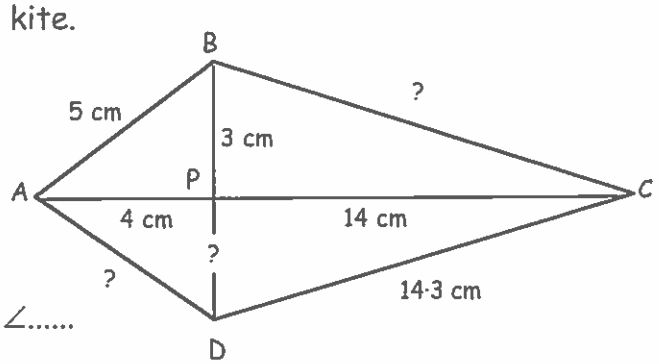
4. a Draw a rhombus with diagonals of length 6 cm and 8 cm.
   b What is the length of each of its sides ?



Exercise 4

1. A **kite** has two pairs of sides the same length.
   Write down **four** more properties for a kite.

2. a Make a neat sketch of kite ABCD and mark in the 3 missing lengths.
   b Copy and complete, **using letters** :-
   (i) AB = ... **(ii)** CD = ...
   (iii) PD = ... **(iv)** ∠DAP = ∠.....
   (v) ∠ABP = ∠..... **(vi)** ∠BCP = ∠.....
   c What is the perimeter of this kite ?



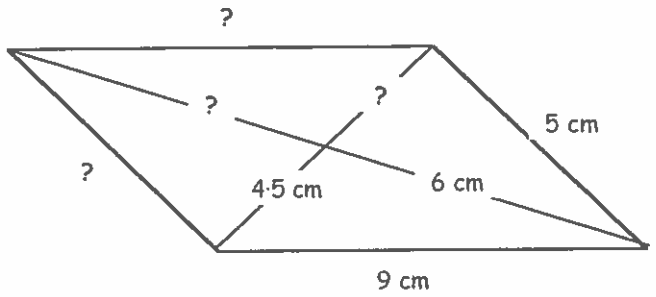
Exercise 5

1. "A **parallelogram** has one line of symmetry". Is this statement true ?
   Write down **four** true properties for a **parallelogram**.

2. What name is given to a parallelogram with diagonals which meet at 90° ?

3. a Make a neat sketch of this parallelogram and mark in the four missing lengths.

b What is the perimeter of this parallelogram ?



Exercise 6

1. **Answer TRUE or FALSE.**

a A square has 4 equal sides and its 4 angles are 90°.

b A rectangle's diagonals bisect each other at 90°.

c A parallelogram has 1 line of symmetry.

d A rhombus has 4 equal sides and has only 2 lines of symmetry.

e A kite has 2 lines of symmetry.

f A rhombus fits into its outline in exactly 4 ways.

g A kite's diagonals meet at 90°, but only one bisects the other.

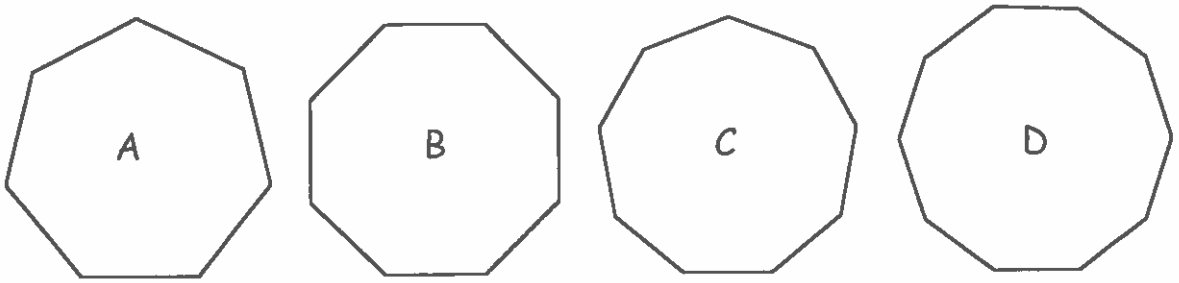
h A parallelogram doesn't have half turn symmetry.

i A rectangle has quarter turn symmetry.

j A rectangle has 2 lines of symmetry, which are its diagonals.

Revision Exercise

1. Write down the names of each of these polygons.



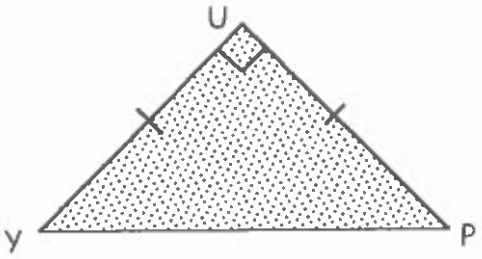
2. Make a neat sketch of :-

a Triangle KLM, an acute angled scalene triangle.

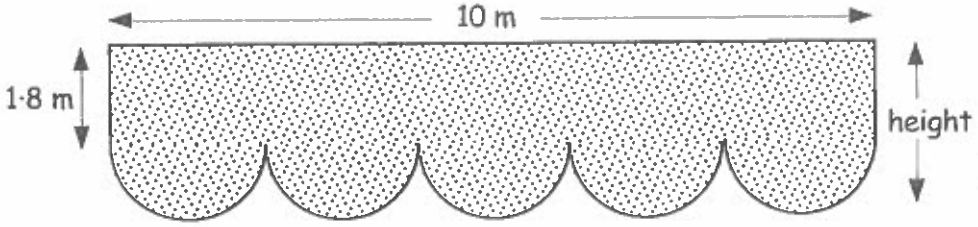
b Triangle PQR, a right angled isosceles triangle.

c Triangle ADE, an obtuse angled isosceles triangle.

3. Name and describe this triangle fully.



4. This shop canopy has five identical semi-circles beneath a rectangle.



a Calculate the length of the diameter of one semi-circle.

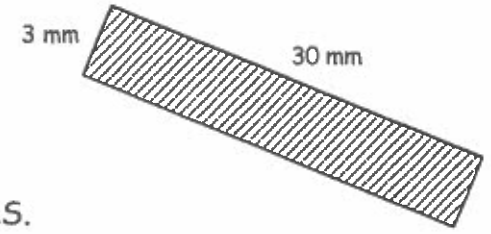
b What must the radius be ?

c Now calculate the height of the canopy.

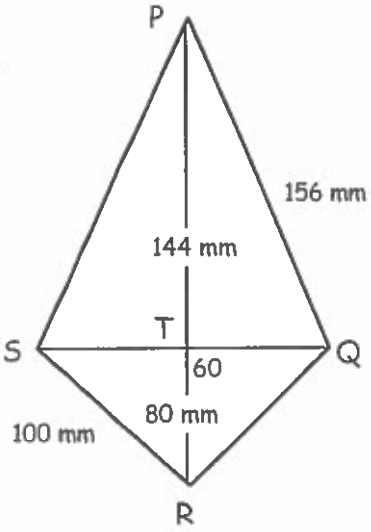
5. Draw a square with perimeter 22 cm.

6. Calculate :- a the perimeter

b the area of this rectangle.



7.



Look at kite PQRS.

a What is the length of :-

(i) ST (ii) PS (iii) RQ ?

b Write down an angle equal to :-

(i) ∠PST (ii) ∠QRT.

8. **Answer TRUE or FALSE.**

a A rectangle's diagonals bisect the end angles.

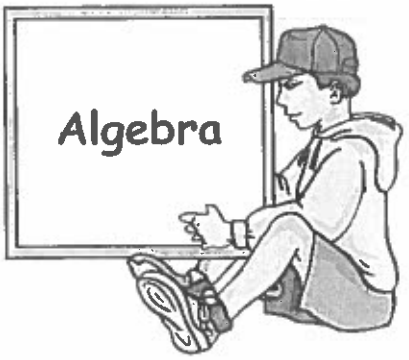
b A square has quarter turn symmetry.

c Only one diagonal of a kite bisects the other.

d A rhombus has its opposite sides parallel.

e The diagonals of a rectangle bisect each other at 90°.

CHAPTER 11



Consolidation

1. What number does ‡ stand for each time here :-

   a $9 + ‡ = 17$ b $‡ \times 6 = 42$ c $‡ - 12 = 9$

   d $‡ \div 8 = 7$ e $‡ \times 42 = 0$ f $17{\cdot}2 + ‡ = 30.$

2. In each of the following, the symbol ◊ stands for +, −, × or ÷.

   Decide which symbol is needed each time here :-

   a $14 \diamond 9 = 5$ b $13 \diamond 2 = 26$ c $2{\cdot}4 \diamond 3{\cdot}2 = 5{\cdot}6$

   d $21 \diamond 21 = 1$ e $25 \diamond 9 = 16$ f $3{\cdot}6 \diamond 5 = 18.$

3. Solve the following equations :-

   a $x + 6 = 17$ b $x - 5 = 17$ c $6 \times x = 54$

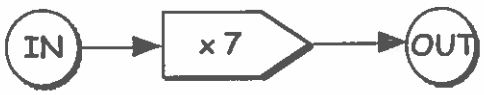
   d $x \div 7 = 8$ e $x - 19 = 19$ f $88 \div x = 8.$

4. Colleen is 23 years old and Donna is aged *.

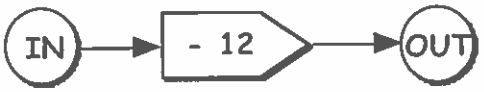
   Their combined age is 42 years.

   a Make up an **equation** using *.

   b Solve it to find how old Donna is.

5. 

   Machine A



   Machine B

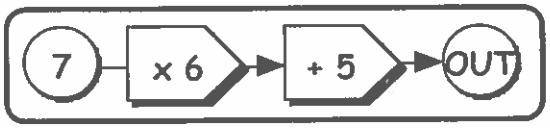
   a What number comes out when 9 is put into Machine A ?

   b What number went into Machine B if the number 78 came out ?

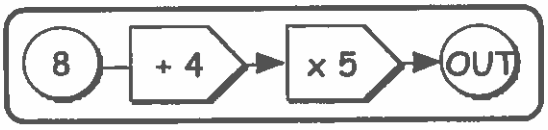
Exercise 1

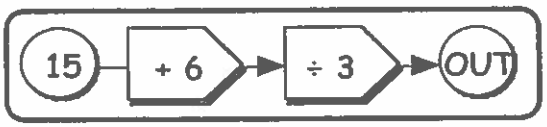
1. Look at these number machines. Write down what number comes OUT :-

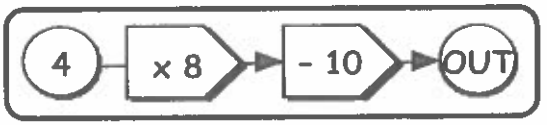
   a

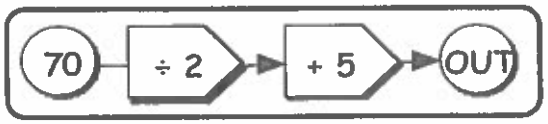


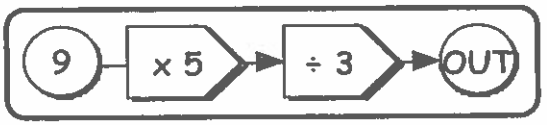
   b



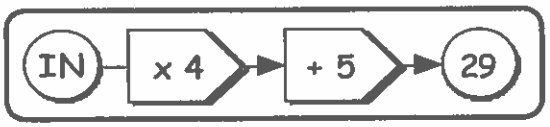
1. c 

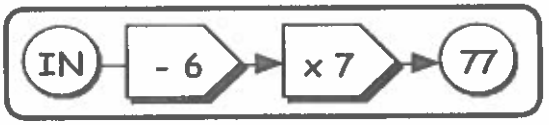
d 

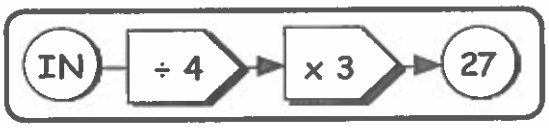
e 

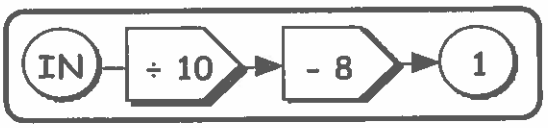
f 

2. For these number machines, write down what number must have gone **IN** :-

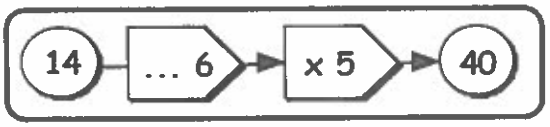
a 

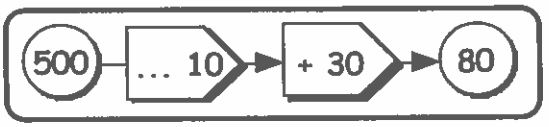
b 

c 

d 

3. Write down the missing sign in these two machines :-

a 

b 

Exercise 2

1. Write down each equation and solve it :-

a $x + 7 = 13$	b $x - 4 = 18$	c $x + 9 = 26$
d $x - 12 = 13$	e $x - 24 = 61$	f $7 + x = 21$
g $23 + x = 33$	h $9 - x = 1$	i $50 - x = 37$
j $2x = 18$	k $5x = 40$	l $7x = 77$
m $9x = 54$	n $20x = 300$	o $2x = 11$
p $4x = 34$	q $8x = 20$	r $\frac{1}{2}x = 25$.

Exercise 3

1. Solve :-

a $2x + 1 = 13$	b $2x - 6 = 2$	c $3x + 5 = 14$
d $3x - 9 = 12$	e $4x + 7 = 27$	f $4x - 5 = 39$
g $6x + 1 = 55$	h $8x - 1 = 79$	i $10x + 2 = 122$
j $3x + 4 = 13$	k $4x + 8 = 28$	l $5x - 3 = 37$.

1. m $6x - 9 = 39$ n $7x + 10 = 52$ o $8x - 30 = 90$

   p $9x - 180 = 0$ q $10x - 10 = 10$ r $2x - 7 = 0$

   s $4x + 1 = 23$ t $8x + 60 = 4$ u $\frac{1}{2}x - 9 = 2$.

2. There were p toffees in a box. 12 were removed.

   I then found that there were 13 left.

   a Make up an equation about the toffees.

   b Now solve it to determine how many there were to begin with.

Exercise 4

1. Copy the following as shown and place a "<" sign or a ">" sign between the numbers :-

   a 7 ... 3 b 4 ... 12 c 0 ... -3

   d -48 ... 73 e 5 ... -2 f -11 ... -13

   g -123 ... -121 h -232 ... -231 i 15 ... $14\frac{3}{4}$.

2. Rewrite the following pairs of numbers and put in the correct sign :-

   a 14 and 5, using "<" b 6 and 7 using ">" c 23 and 21, using "<"

   d -9 and -7, using ">" e -4 and 4, using ">" f 8 and -2 using, "<".

3. Solve these inequalities, choosing x only from the numbers ..... {0, 1, 2, 3, 4 or 5}.

   a $x > 3$ b $x < 2$ c $x \geq 4$

   d $x \leq 2$ e $x > 1$ f $x \leq 5$

   g $x > 5$ h $x \geq 0$ i $x \leq 0$.

4. Make up an inequality for this statement :-

   "The minimum number of players for five-a-sides is 10.
   A pitch was booked for P players. => P ....."

Exercise 5

1. Solve the inequalities, leaving your answer in the form e.g. $x \geq 2$.

   a $2x > 16$ b $3x < 27$ c $5x > 40$

   d $6x < 54$ e $7x \geq 35$ f $9x \leq 90$

1. g $8x \geq 104$ h $10x \leq 45$ i $20x > 200$

   j $\frac{1}{2}x < 20$ k $\frac{1}{4}x \geq 50$ l $\frac{1}{3}x - 1 \leq 5$.

2. Make up an inequality for this story and solve it :-

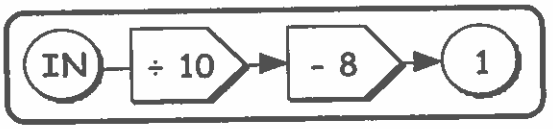
   Joe and Helen are saving up for a TV, priced £819.

   Joe has saved £y and Helen has saved £550.

   At this moment, they don't have enough to buy the TV. => .....

Revision Exercise

1. What number must have gone **into** this number machine ?



2. Write the sign (+, −, ÷, x) that * stands for each time here :-

   a $7 * 3 = 21$ b $29 * 14 = 15$ c $117 * 3 = 39$.

3. **Solve** these equations to find the value of x.

   a $x + 4 = 12$ b $x - 9 = 11$ c $x + 25 = 32$

   d $x - 14 = 49$ e $3x = 33$ f $\frac{1}{3}x = 8$.

4. There were 85 people in a cinema. x more arrived just after the movie began, giving a full house of 125.

   a Make up an equation about the people in the cinema.

   b Solve the equation to find how many people must have arrived late.

5. Copy the following and put the correct "<" sign or ">" sign between the numbers.

   a 28 .... 29 b 7 .... -7 c -414 .... -144.

6. In this question you can choose x only from the numbers ..... {-3, -2, -1, 0, 1, 2, 3}

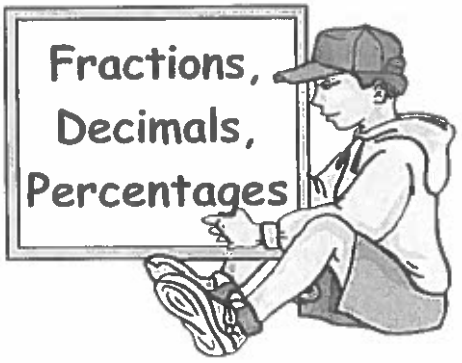
   Write down the solutions for :-

   a $x > -3$ b $x < -1$ c $x \leq 2$ d $x > -1\frac{1}{3}$.

7. **Solve** the following inequalities, leaving your answer in the form e.g. $x > 2$ etc.

   a $x + 9 > 14$ b $x - 11 < 7$ c $8x \leq 72$ d $4x + 8 \geq 50$.

CHAPTER 12



Consolidation

1. Copy and complete :-

   a $\frac{1}{3} = \frac{?}{18}$ b $\frac{4}{5} = \frac{28}{?}$ c $\frac{19}{?} = \frac{38}{40}$.

2. Write down **two** fractions equivalent to :-

   a $\frac{1}{7}$ b $\frac{2}{9}$ c $\frac{5}{11}$.

3. Write each of these fractions in their **simplest** form :-

   a $\frac{7}{14}$ b $\frac{16}{20}$ c $\frac{75}{100}$.

4. Find :-

   a $\frac{1}{8}$ of £24 b $\frac{3}{5}$ of 200 m c $\frac{5}{9}$ of 72 kg.

5. In a secondary school, there are 180 new entrants into S1.
   On the first day $\frac{1}{3}$ of them turned up without a tie.
   Of those with a tie, only $\frac{3}{20}$ were wearing a school blazer.
   How many of the original 180 were wearing a tie but not wearing a school blazer ?

6. Write each of the following as a **fraction** :-

   a 27% b 79% c 8% d 1%.

7. Write each of the following as a **decimal** :-

   a 51% b 32% c 40% d 6%.

8. Write each of the following as a **fraction** and as a **decimal** :-

   a 15% b 39% c 7% d 3%.

9. Write each **fraction** or **decimal** as a **percentage** :-

   a $\frac{63}{100}$ b 0·97 c $\frac{5}{100}$ d 0·04.

10. Find :-

    a 50% of 78p b 25% of 24 km c 50% of £19 d 10% of 6 kg.

11. Find :-

    a 57% of 200 g b 81% of £1500 c 17% of £420.

Exercise 1

1. Reduce each percentage to a fraction in its **simplest form** (where possible) :-

a 45%	b 20%	c 12%	d 52%
e 4%	f 28%	g 96%	h 85%.

2. Calculate :-

a 50% of £12	b 20% of £35	c 10% of £73
d 1% of 700 m	e 5% of 800 kg	f 100% of £19·50
g 75% of £32	h 75% of £3·20	i 25% of 900 cm.

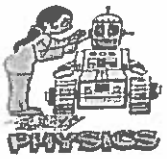
3. Write each of the lists below in order (**smallest** first) :-

a 37%, $\frac{38}{100}$, 0·4, 0·36 b 82%, $\frac{4}{5}$, 0·81, $\frac{22}{27}$, 0·825 .

4. Jenny sat four exams.

She scored $\frac{91}{100}$ in Maths, $\frac{9}{10}$ in Biology, $\frac{22}{24}$ in Chemistry and $\frac{37}{40}$ in Physics.

What is Jenny's best and poorest subject ?



Exercise 2

1. Work out these percentages by using their fractional equivalents :-

a 10% of £80	b 20% of £90	c 40% of £150
d 10% of £3	e 5% of £80	f 75% of £120
g $33\frac{1}{3}$% of £18	h $66\frac{2}{3}$% of £12	i 25% of £280
j 30% of £17	k 20% of £550	l 60% of £200
m $33\frac{1}{3}$% of £6·90	n $66\frac{2}{3}$% of £12·60	o 50% of £9
p 75% of £21	q 10% of £1900	r 5% of £1900
s 1% of £8000	t 2% of £8000	u 3% of £8000
v $33\frac{1}{3}$% of £6300	w 5% of £600	x $2\frac{1}{2}$% of £500.

Exercise 3

1. A school has 850 pupils. 10% of the pupils come to school on school buses.

How many pupils use the buses ?

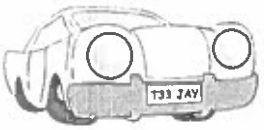
2. 

Two hundred and forty carrots were planted in a garden.
20% of them were soon eaten by rabbits.

How many carrots were eaten ?

3. John paid a $33\frac{1}{3}$% deposit on a £12600 car.

How much money did he still have to pay ?



4. 

The price tag on a skirt reads £80.
It also carries a $12\frac{1}{2}$% **discount** label.

How much will the skirt cost with the reduction ?

5. A delivery man is set to receive a 7% pay rise.

If his pay just now is £428 per week, what will his new pay be ?

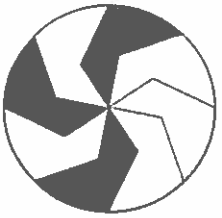


6. 

My car cost £9500 new.
After 5 years it had lost 82% of its value.

How much was my car worth after those 5 years ?

Revision Exercise



1. What fraction of this shape is coloured black ?

2. Write down TWO **fractions equivalent** to :-

   a $\frac{1}{4}$ b $\frac{1}{9}$ c $\frac{2}{7}$ d $\frac{5}{13}$.

3. Write these as fractions in **simplest form** :- a $\frac{32}{48}$ b 15%.

4. Write each fraction or decimal as a **percentage** :-

   a $\frac{18}{50}$ b 0·67 c $\frac{3}{10}$ d 0·4.

5. Find :-

   a $\frac{3}{5}$ of £12·50 b $\frac{7}{9}$ of 63 km c 40% of 85 euros

   d $33\frac{1}{3}$% of £54 e $66\frac{2}{3}$% of 12p f $12\frac{1}{2}$% of 56 kg.

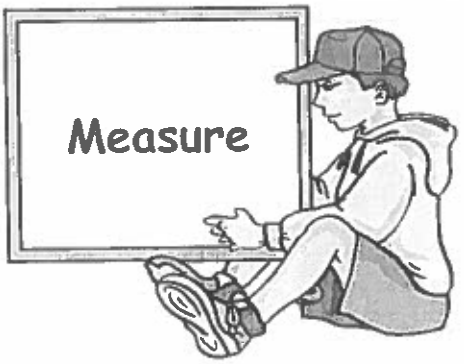
6. Write these fractions as percentages :-

   a $\frac{7}{20}$ b $\frac{3}{25}$ c $\frac{30}{40}$ d $\frac{7}{8}$.

7. Calculate :- a 46% of 2300 kg b 2·5% of £8.

8. Write these in order, **smallest** first :- $\frac{4}{11}$, 0·39, 38%, 0·4.


CHAPTER 13



LENGTH

1. Write down the length of the line below in :-

   a millimetres b centimetres c centimetres and millimetres.

2. Draw a line which is 6·5 centimetres long.

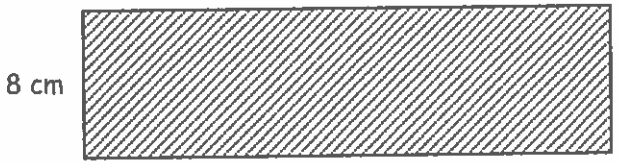
3. Change :-

   a 7 m to cm b 18 cm to mm c 1·3 km to m

   d 3500 m to km e 40 cm to m f 13 mm to cm.

4. The lace on this shoe is 58·5 cm long. A piece 77 mm is cut off.
   What is the length of the remaining lace, in **millimetres** ?

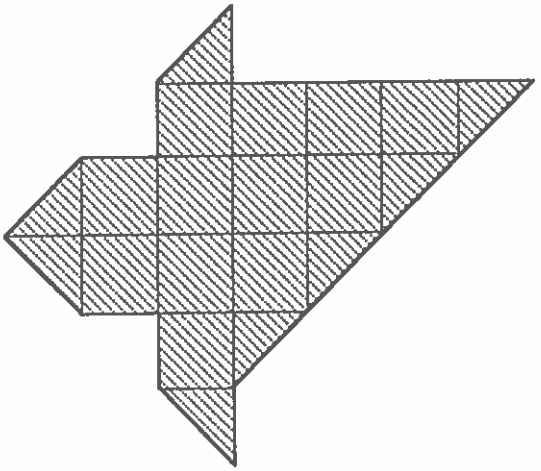
5. The **perimeter** of this rectangle is 72 cm.



Calculate the length of the **longer** side .

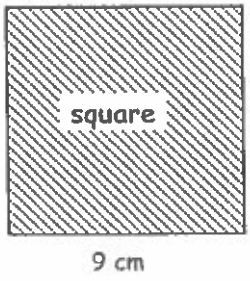
AREA

1. Write down the **area** of this shape in cm^2.

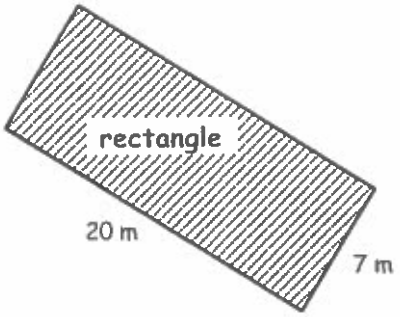


2. Calculate the area of each of these shapes :-

a



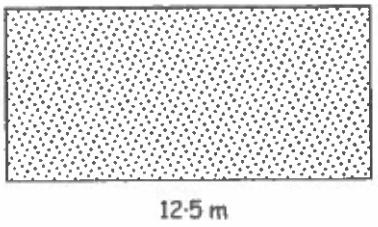
b



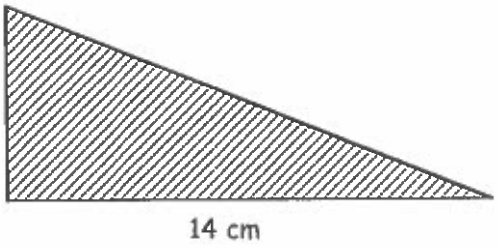
3. This rectangular floor has to be covered in linoleum.

a Calculate the **area** of the floor in m^2.

b If linoleum costs £6·30 per square metre, calculate the cost of covering the floor.



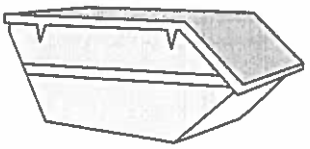
4.



Calculate the **area** of this right angled triangle in cm^2.

VOLUME

1. Put these shapes in order, starting with the one which has the **largest** volume.



Pedal Bin, Wheelie Bin, Plant Pot, Pencil Case, Skip.

2. A doctor prescribes a medicine to a patient.

The medicine has to be taken three times a day and four 5 ml spoonfuls must be taken each time.

How many days will the medicine last if the bottle holds 600 ml ?

3. A small tank holds 1280 millilitres of water.
A large cup holds 120 millilitres and a small cup holds 40 millilitres.

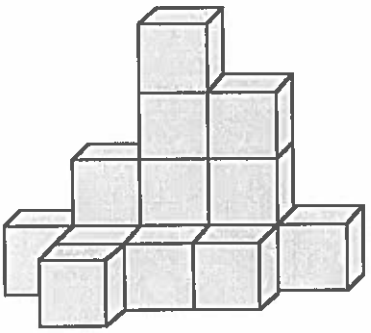
a How many small cupfuls can I get from a full tank ?

b How many **full** large cupfuls can I get from a full tank ?

c The maximum number of large cupfuls have been taken from the tank.

How many small cupfuls are left ?

4. Write down the volume of this shape, in cm^3.



5. a Change to millilitres :- (i) 3 litres (ii) 9·2 litres (iii) 0·5 litres.

   b Change to litres :- (i) 6700 ml (ii) 21 000 ml (iii) 310 ml.

6. Find the volume of this tile which is 0·5 cm thick.

WEIGHT

1. Change from **kilograms** to **grams** :-

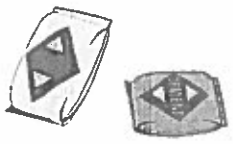
   a 5 kg b $\frac{1}{4}$ kg c 21·5 kg

   d 3 kg 400 g e 8 kg 12 g f $3\frac{3}{4}$ kg .

2. Change these weights to **kilograms** :-

   a 6000 g b 14 100 g c 450 g

   d 7200 g e 8070 g f 2006 g.

3. 

   Walter buys two bags of ready made cement.

   The large one weighs $9\frac{1}{4}$ kg, the smaller one 6 kg 750 g.

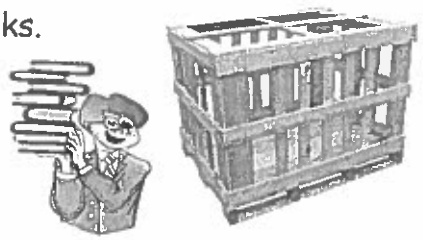
   How much lighter is the smaller one (in kg and g) ?

4. This crate is to be loaded with 8 identical boxes of books.

   The empty crate weighs 12 kg.

   The loaded crate weighs 160 kg.

   Calculate the weight of one box of books.

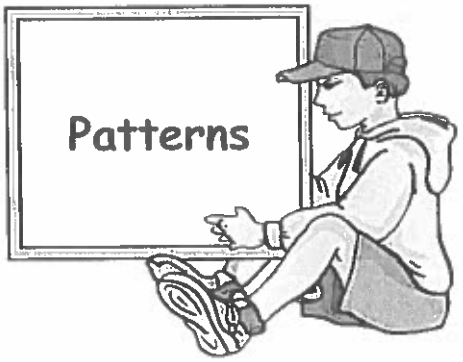


5. 

   A worm (9 g) is eaten by a frog (27 g), which is eaten by a lizard (250 g), which is eaten by a snake (1·3 kg), which is eaten by a hawk (1450 g).

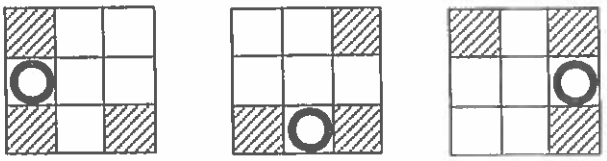
   How much does the hawk **now** weigh (in kg) ?

CHAPTER 14



Consolidation

1. Draw the **4th** pattern in this sequence.



.....

2. a Describe this pattern in words :- 4, 19, 34, 49, ..., ...

   b Write down the next **two** terms of the pattern.

3. Describe each of these patterns **and** write down the next **two** terms each time :-

   a 3, 11, 19, 27, 35, ...

   b 2, 20, 38, 56, ...

   c 91, 82, 73, 64, ...

   d 1, 4, 9, 16, 25, ...

4. Write down the next **two** letters in these patterns :-

   a B, E, H, K, ...

   b W, T, Q, N, ..., ...

5. Write down :- a the 10th square number b the 30th square number.

Exercise 1

1. Copy and complete the table which shows the number of legs on ants.

No. of Ants (A)	1	2	3	4	5	6
No. of Legs (L)	6	12	?	?	?	?

   a Copy and complete :- **number of legs** = ... x the number of ants.

   b Write a formula using symbols connecting L and A.

   c Use your formula to find the total number of legs on 20 ants.

2. Copy and complete the table which shows the number of strawberries in a sundae.

No. of Sundaes (s)	1	2	3	4	5	6
No. of Strawberries (S)	15	30	?	?	?	?

   a Write a formula using symbols connecting S and s.

   b Use your formula to find the number of strawberries needed for 40 sundaes.

3. For the three tables below, find formulae (or rules) connecting the two letters :-

a

No. of Magazines (M)	1	2	3	4	5	6
No. of Pages (P)	40	80	?	?	?	?

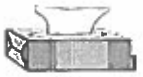
P = ... × ....

b

No. of Burgers (B)	1	2	3	4	5	6
Cost in pence (C)	75	150	?	?	?	?

C = ... × ....

c

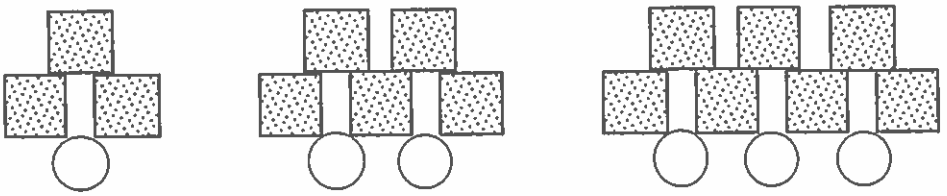


No. of Boxes (B)	3	4	5	6	7	8
No. of Hankies (H)	360	480	?	?	?	?

H = ... × ....

Exercise 2

1. Here is a pattern made with squares and circles.



1 circle
3 squares

2 circles
5 squares

3 circles
7 squares

a Draw the next pattern of squares and circles.

b Copy the following table and complete it :-

No. of Circles (C)	1	2	3	4	5	6
No. of Squares (S)	3	5	7	?	?	?

c Write a formula using symbols connecting S and C. S = ... × C + ...

d Use your formula to find how many squares are needed for 50 circles.

2. This table shows the cost of hiring a vacuum cleaner for a few days :-

No. of days hired (D)	1	2	3	4	5	6
Cost in £'s (C)	9	14	19	24	?	?

a How much will it cost to hire the cleaner for **(i)** 5 days **(ii)** 6 days ?

b How much **extra** does it cost for each additional day of hire ?

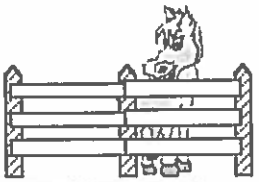
2. c Write down the formula for determining the cost of hiring the vacuum cleaner.

C = ... × D + ...

d How much will it cost to hire the cleaner for a fortnight ?

3. Shown below are two tables of values connecting pairs of letters.

Write down a formula or rule connecting the second letter in the table to the first letter.



a

Buses (B)	1	2	3	4
Cars (C)	45	85	125	165

C = ...

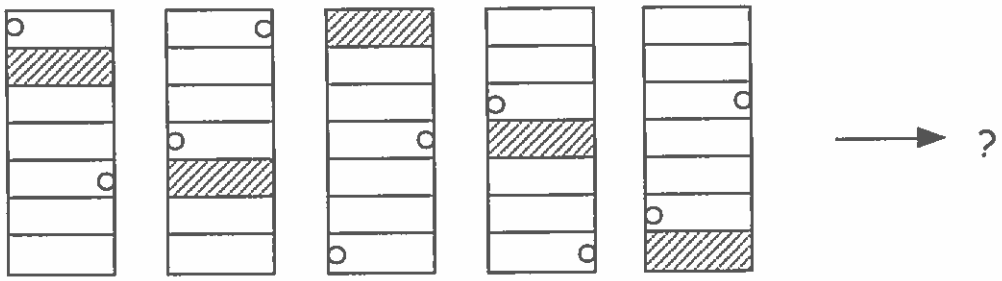
b

Fence Posts (P)	2	3	4	5
Boards (B)	3	6	9	12

B = ...

Revision Exercise

1. Draw the next shape in this pattern.



2. Write down the next **three** numbers in each of these sequences :-

a 3, 9, 15, 21, ..., ..., ...

b 86, 74, 62, 50, ..., ..., ...

c 3200, 1600, 800, ..., ..., ...

d 8, 11, 15, 20, ..., ..., ...

3. Write down all the square numbers between 48 and 122.

4. An amateur referee's fees are shown in the table below.

No. of Games (G)	1	2	3	4	5
Fees in £'s (F)	20·50	41·00	61·50	?	?

a How much will a referee have after :- (i) 4 games (ii) 5 games ?

b Write a formula connecting F and G using symbols.

c Use your formula to find how much a referee will have earned after 10 games.

d A referee's total fees for a season was £410. How many games had he refereed ?

5. A plumber bills his customers with an initial call out charge plus an hourly rate.
Examples of his charges are shown in the table :-

No. of Hours (H)	1	2	3	4	5	6
Charge in £'s (C)	46	56	66	?	?	?

a How much will it cost to call out the plumber for 4 hours ?

b How much extra does he charge for each additional hour ?

c Write down the formula for determining the cost of calling him out :-

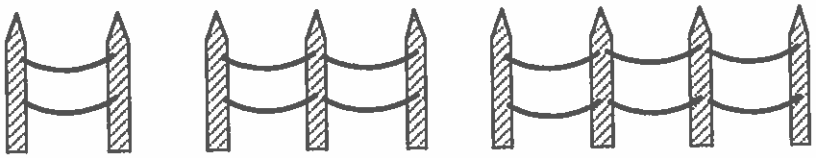
C = ... x H + ...

d What is his call out fee ?

e What does he charge for a job lasting 8 hours ?

f One job had to be done over 3 days, the total bill coming to £236.
How many hours did this job take ?

6. A fence is made using strips of wire and posts.



2 posts
2 strips

3 posts
4 strips

4 posts
6 strips

a Copy and complete the table below.

No. of Posts (P)	2	3	4	5	6	7
No. of Strips (S)	2	4	6	?	?	?

b Write down a formula linking S and P. S = ... x P - ....

c How many strips of wire would you need if you had 10 posts ?

d How many posts would you need if you had 98 strips of wire ?

7. Shown below are two tables of values connecting pairs of letters.
Write down a formula connecting the second letter to the first letter.

a

P	1	2	3	4
M	10	25	40	55

b

H	1	2	3	4
F	10	14	18	22

CHAPTER 15

Consolidation

1. a Which point has coordinates :-

   (i) (9, 7) (ii) (4, 0) ?

   b Write down the coordinates of :-

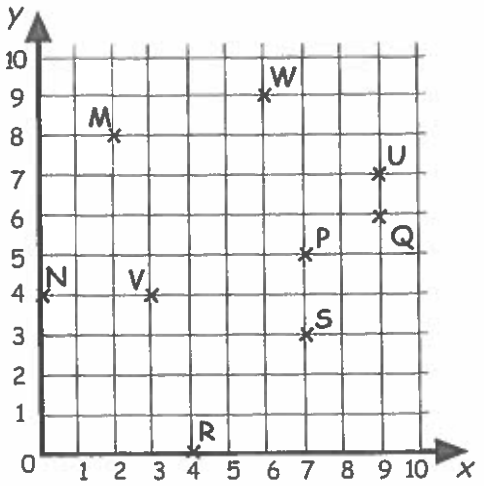
   (i) M (ii) W.

   c When 4 of the points are joined a square is formed.

   (i) Which 4 points ?

   (ii) Write down their coordinates.

   d Which point lies on the *y*-axis ?



   e Name the point which has its *x*-coordinate 3 larger than its *y*-coordinate.

2. a Draw a coordinate grid like the one in question 1 on squared paper.

   Make the horizontal and vertical axes both go up from 0 to 10.

   b Mark with a cross the following four points :-

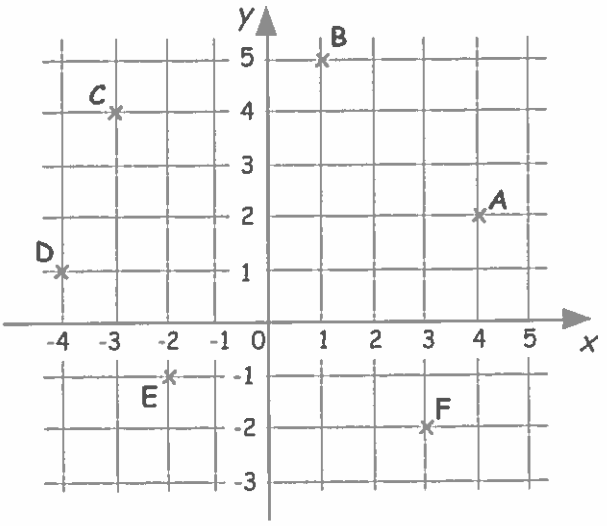
   A(6, 3) B(8, 5) C(4, 9) D(2, 7).

   c Join A to B to C to D and back to A. What shape have you formed ?

   d Draw in the shape's two diagonals and state the coordinates of the point of intersection.

Exercise 1

1. Write down the coordinates of the 6 points shown in the coordinate diagram.



2. Draw a coordinate diagram the same as question 1 and plot the points :-

P(-3, 1) Q(-1, -2) R(1, 1) S(-1, 4).

What kind of quadrilateral is PQRS ?

3. a Draw a set of axes, (-5 to 5 on both scales) and plot the four points

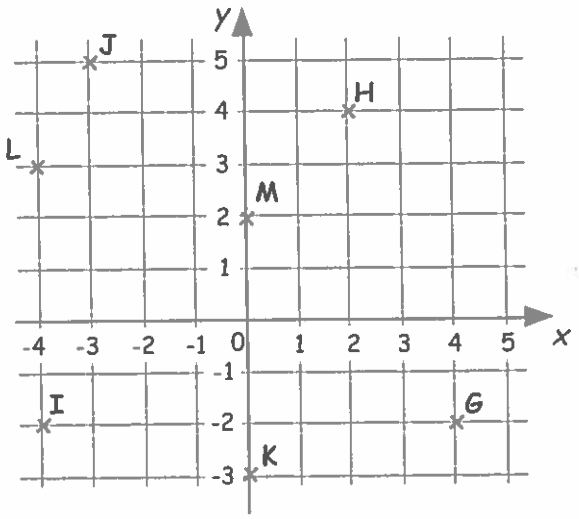
K(-4, -1), L(2, -1), M(3,3), N(-3, 3).

b Join the four points and state what type of shape is formed.

c Reflect the four points over the *x*-axis to form another four-sided shape.

d Write down the coordinates of the four corners of this new reflected shape.

Revision Exercise



1. a Which point has coordinates :-

(i) (0, -3) (ii) (-3, 5)

(iii) (4, -2) (iv) (-4, -2) ?

b Write down the coordinates of :-

(i) H (ii) L.

c When K and 3 other points are joined a **KITE** is formed.

(i) Which 3 points ? (ii) Write down their coordinates.

d Which points lies on the *y*-axis ?

e Which point has its *y*-coordinate 8 more than its *x*-coordinate ?

2. a Draw a coordinate grid (-8 to 8 on both scales) and plot the points :-

A(-1, 4), B(-4, 1) and C(-1, -2).

b D is a point to be put on the grid so that figure **ABCD** is a **square**.

On your diagram plot the point D and write down its coordinates.

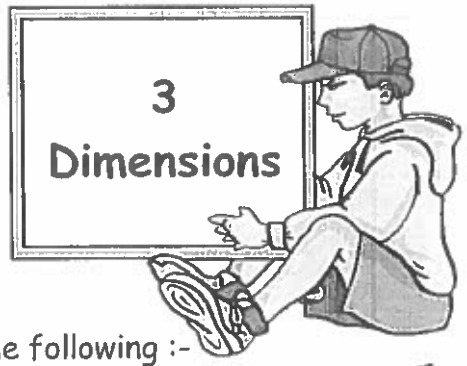
c Join A to C and join B to D.

You now have the two diagonals of the square.

Write down the coordinates of the point where the two diagonals meet.

d Reflect square **ABCD** in the ***y*-axis** and write down the coordinates of the corners of the new square.

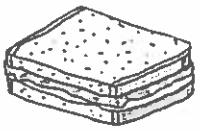
CHAPTER 16

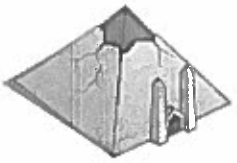


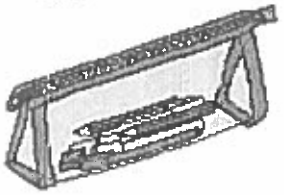
Consolidation

1. What 3-dimensional **mathematical** shape is each of the following :-

a 

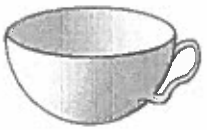
b 

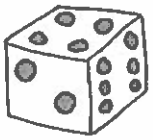
c 

d 

e 

f 

g 

h 

2. How many :-

a **edges** does a **sphere** have

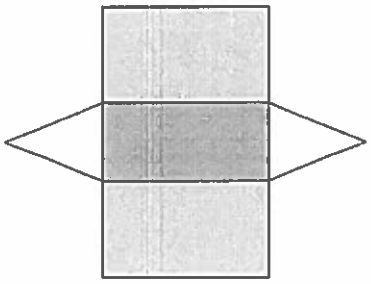
b **faces** does a **hemisphere** have

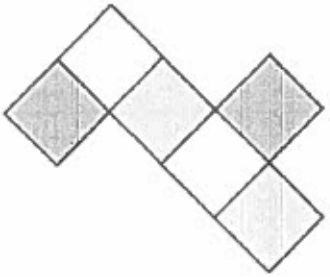
c **vertices** does a **cuboid** have

d **vertices** does a **triangular prism** have

e **edges** does a **square based pyramid** have ?

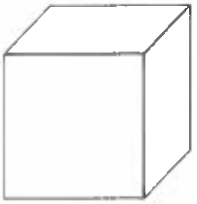
3. Which 3D figure would you get when you cut out these shapes and fold them ?

a 

b 

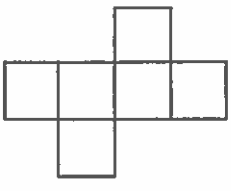
Exercise 1

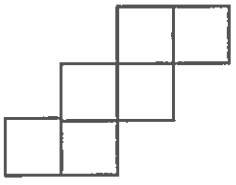
Squared Paper Needed

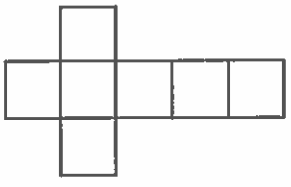


1. Draw a full size net of a cube with sides 4 centimetres.

2. There are 11 nets of a cube in total. Here are sketches of 3 of them.







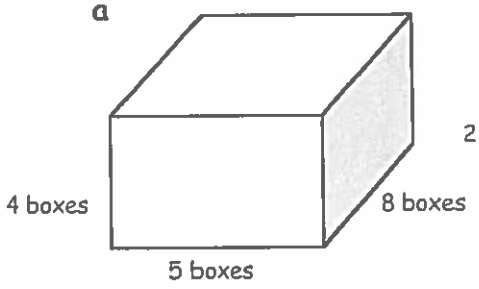
Try to make sketches of at least another **4 of the eight** which remain.

Exercise 2

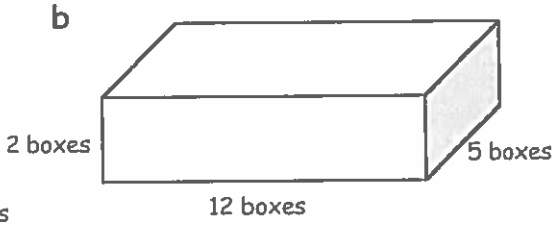
Squared Paper Needed

1. Neatly, draw nets of the following cuboids. Use squared paper boxes.

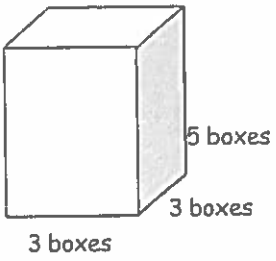
a



b

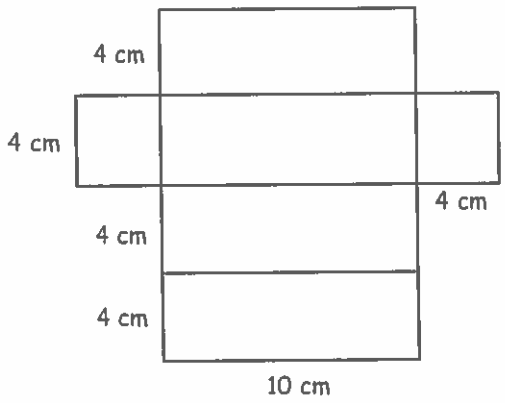


c

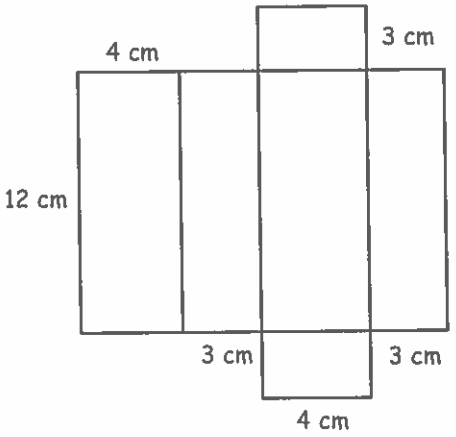


2. Make sketches of the cuboids with these nets and fill in their dimensions :-

a



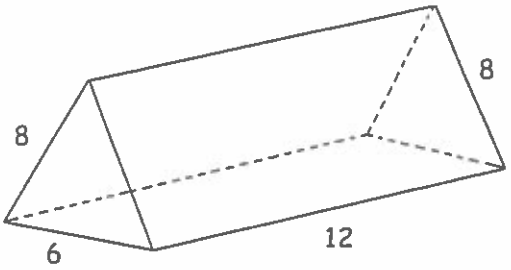
b



Exercise 3

Squared Paper Needed

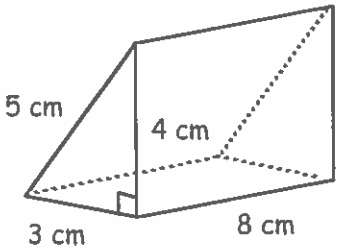
1. Draw a full size net of this triangular prism, units are boxes.

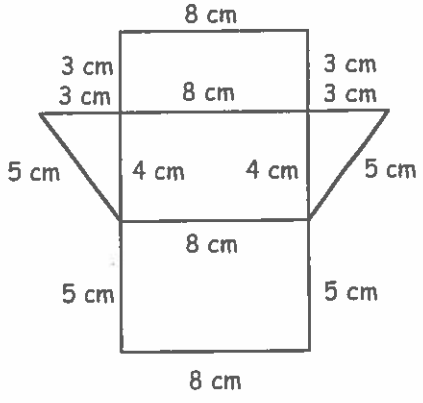


2. A sketch of the net of this **right angled** triangular prism is shown beside it.

   Make an accurate drawing of the net.

   Units are centimetres.

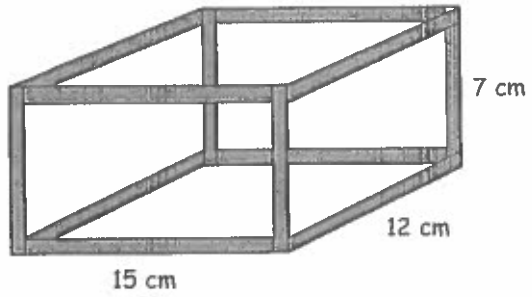




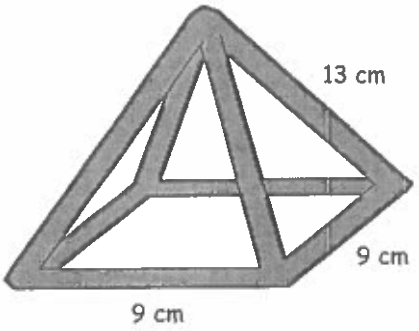
Exercise 4

1. Find the total length of straw required to make each of these skeleton models :-

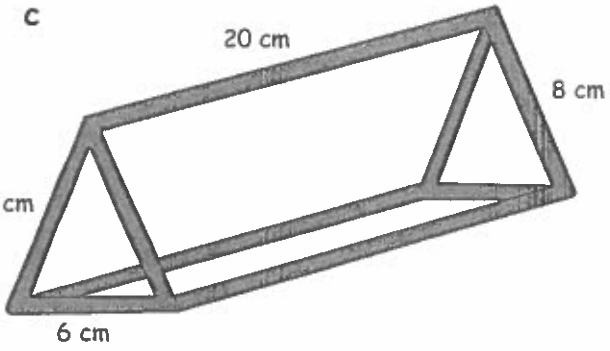
a



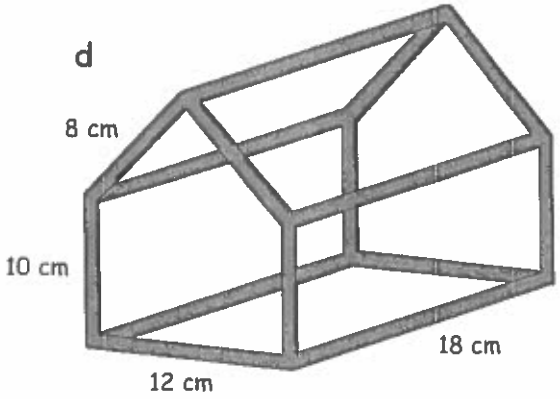
b



c



d



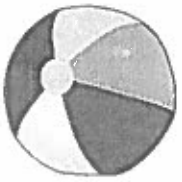
Revision Exercise

1. Name the **2-dimensional** and the **3-dimensional mathematical** shapes shown below :-

a

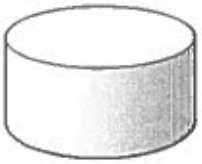
b

c

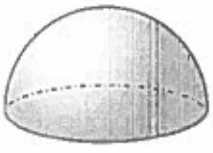


d

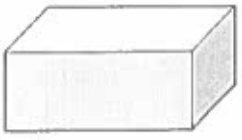
e



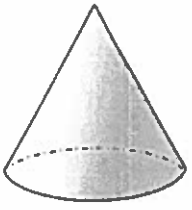
f



g



h



2. How many **sides/edges** has a :-

a	pentagon	b	nonagon	c	dodecagon
d	square based pyramid	e	hemisphere	f	cylinder ?

3. How many **faces** has a :-

a cuboid b cone c cylinder ?

4. How many **vertices** has a :-

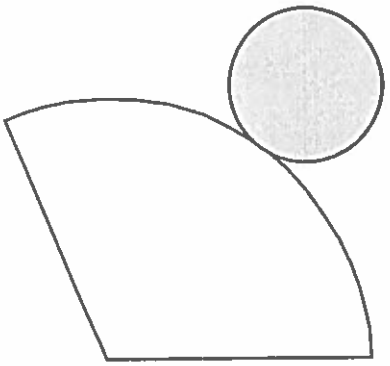
a square based pyramid b cone c sphere ?

5. Name a 2D shape which has :-

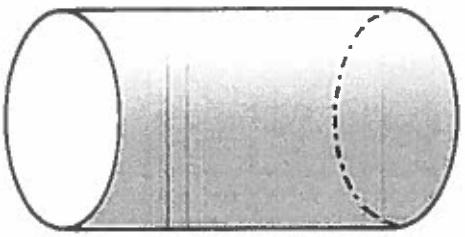
a no lines of symmetry b only one diagonal bisecting the other

c 4 sides equal and end angles of 90° d 8 sides.

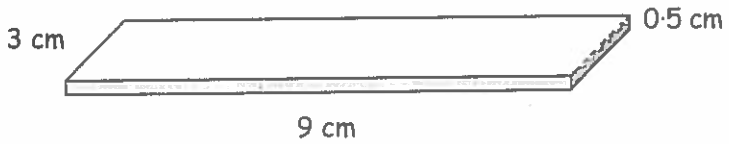
6. Which 3D shape has a net which looks like this ?



7. Make a neat sketch of a **net** for the 3D shape below.



8. Make an **accurate drawing** of the **net** of this cuboid.

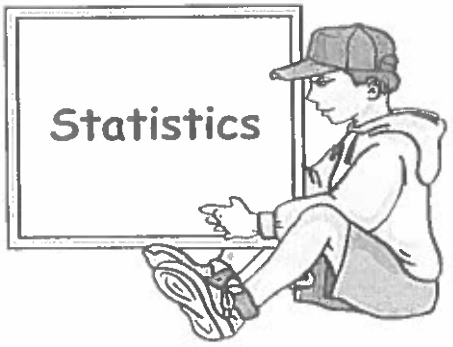


9. Make a neat sketch of a :-

a parallelogram b rhombus c isosceles triangle

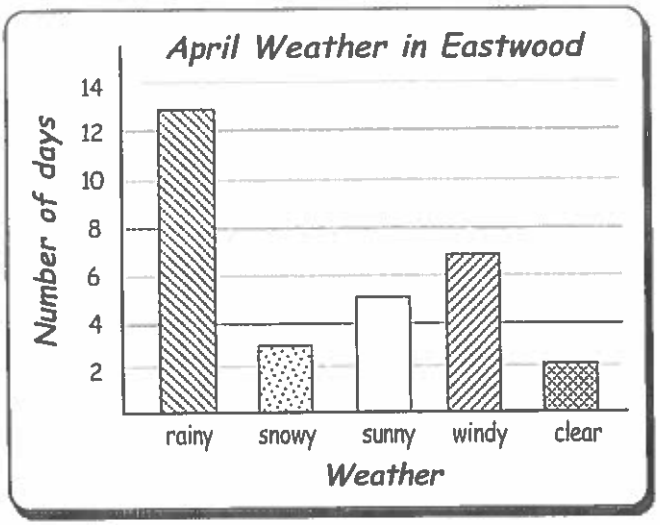
d cylinder e cone f hemisphere.

CHAPTER 17



Consolidation

1. The **bar graph** shows the typical April weather in Eastwood.



   a. How many days are :-

      (i) rainy (ii) sunny

      (iii) windy (iv) clear ?

   b. How many more rainy days than snowy days are there ?

   c. If there are 5 less rainy days and 5 more sunny days, how many sunny days will there be ?

   d. Does the graph cover all the days in April ? Explain.

2. A group of S4 pupils in a school were asked about their career choice - "what kind of job would you like to see yourself doing ?" Here's their answers :-

mechanic	nurse	plumber	plumber	joiner
nurse	nurse	joiner	nurse	nurse
joiner	mechanic	nurse	joiner	mechanic
teacher	plumber	teacher	mechanic	mechanic
plumber	nurse	plumber	nurse	nurse
nurse	plumber	nurse	joiner	plumber

   a. Draw a **frequency table** to show this information with the use of **tally marks**.

   b. Draw and label a neat **bar graph** to represent this information.

3. Toni's Hot Dog Stand is tracking the number of hot dogs sold each day.

   The results are shown in the table.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10	30	45	35	20	50

   Draw a neat labelled **line graph** to show this information.

4. A group of boys and girls spent a week at Big Oak Summer Camp.

The pie chart shows their responses to being asked what bit they liked the best.

It has been divided into 20 equal sectors.

a What fraction does each sector stand for ?

b What fraction of those present liked :-

(i) Craft Work (ii) the Camp Fire ?

c There were 500 children at the camp.

How many of them liked :-

(i) Horse Riding (ii) Canoeing ?

5. Shown are the prices for 2 cruise ships sailing in the Mediterranean Sea.

	October	November	December	January
Princess Bea	£1590	£1755	£1875	£1580
Ocean Lady	£1600	£1750	£1890	£1560

a How much will it cost to cruise in the Med. on the Princess Bea in November ?

b If you want the cheaper cruise in December - which ship should you choose ?

c Ami Thomas paid £1750 for her cruise.

(i) Which ship did she sail on ? (ii) In which month did she travel ?

d Compare the December prices to the January prices.

Suggest a reason for the reduction.

6. Here is an extract from a 2012 calendar, showing the month of October.

Sun	Mon	Tues	Wed	Thur	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

a On what day of the week was September 30th ?

b What was the day and date 2 weeks after October 19th ?

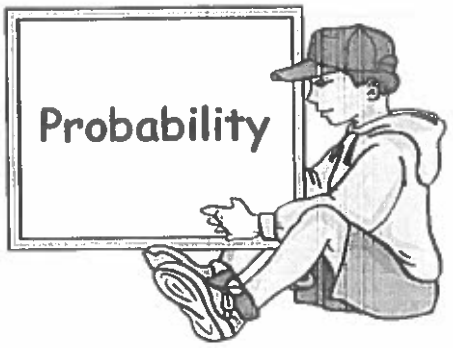
c It was October 24th, 2 weeks after my birthday. What date is my birthday ?

d The week beginning 21st Oct. saw holiday prices rise. Why was this ?

e On what day of the week was Halloween ?

f On what day of the week in November was Guy Fawkes bonfire night ?

CHAPTER 18



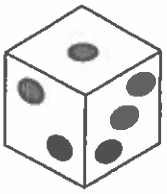
Exercise 1

Use these words to answer the following questions :-

(certain - likely - an even chance - unlikely - impossible)

1. Terry is rolling a six sided die.
   If he rolls a 1, 2 or a 3 he wins the game.
   If he rolls any other number he loses.

   What's his chances of winning ?



2. 

   Doreen was asked to choose a number from 1 to 20.

   What is the chance of her choosing :-

   a the number 9 b an odd number

   c the number 21 d a number divisible by 3 ?

3. When golfing, Monty got out of a sand bunker, first time, 47 times out of the last 50 times he ended up in one.

   What is Monty's chance of getting out first time when he is next in a bunker ?

Exercise 2

1. On a plate of scones, 7 are fruit and 3 are plain.

   What is the **probability** that on your first pick you will choose a fruit scone ? (i.e. what is **P(fruit scone)** ?)

2. 

   In a race there are 26 cars. 13 are red, 13 are yellow.

   What is the probability of a yellow car winning ?

3. A bag contains 6 ten pence, 7 two pence and 4 fifty pence coins.
   If Val puts her hand into the bag and pulls out one coin, what is the **probability** it will be a coin worth :-

   a 10p b 2p c 50p d £1 ?

4. Sandy is asked to write down his date of birth.

   What is the **probability** he was born in a month ending in the letter Y ? **(P(Y))** ?