S1 Final Assessment Revision Booklet B MP1/2

Contents

Percentages

Exercise 1 Percentages - no calculator

1. Find each of the following **without** a calculator :-

   a 10% of £24 **b** 30% of £420 **c** 20% of $55 **d** $33\frac{1}{3}$% of 690 kg

   e 25% of £32 **f** 75% of 50 m **g** $66\frac{2}{3}$% of 39 km **h** 5% of $600

   i 3% of £7 **j** 22% of 7000 **k** 2·5% of 160 cm **l** 35% of €700

2. **a** A shop is giving a 20% discount on a £240 exercise bike.

   How much is the bike now ?

   b Julian cycles 30 km **per day** every day. He is going to reduce this by 15%.

   How many km will he cycle next **week** ?

3. A bank pays an annual rate of 5% interest on their High Fliers account. Gaz leaves £4800 in his account for a year.

   How much interest will he have after :-

   a one year **b** six months **c** three months ?

4. Five hundred students were asked their favourite take away.

   40% - Pizza 35% - Chinese 20% - Indian the rest - Chip shop

   How many students chose :- **a** Chinese **b** Chip shop ?

Exercise 2 Percentages with a calculator

1. Find using a calculator :- (Show all your working)

   a 23% of 136 km **b** 76% of 78 kg **c** 19% of 320 m

   d 38·5% of £700 **e** 0·6% of $1260 **f** 12·5% of €40

   g 9% of £340 **h** 111% of 750 km **i** 3·7% of £10.

Percentages

2. a A farmer has 3200 chickens. 32% have caught a virus.

   (i) What percentage of chickens do NOT have a virus ?

   (ii) How many chickens do NOT have a virus ?

   b Ninety percent of the chickens produce an egg every **day**.

   How many eggs are produced every **week** ?

   c 2·5% of the weekly produce has to be destroyed.

   How many eggs are destroyed ?

3. 

Last November, Norma weighed 64 kg.
After Xmas, her weight had increased by 9%.

What was her weight after Xmas ?

4. Twins Joe and Jack are sales directors who earn £28 000 each.

   - Joe is given a wage rise of 7·5%.
   - Jack has his wage reduced by 4%.

   How much **more** does Joe now earn than Jack ?

Exercise 3 Linking fractions, decimals & percentages

1. Change each of these fractions to percentages, correct to 1 decimal place :-

   a $\frac{2}{3}$ b $\frac{1}{7}$ c $\frac{71}{90}$ d $\frac{142}{80}$.

2. Heather scored the following in four tests :-

   Maths - $\frac{17}{20}$ *English* - $\frac{26}{32}$

   French - $\frac{33}{45}$ *Music* - $\frac{7}{10}$

   a Change each test mark into a percentage.

   b Which was her best score ?

3. Re-write the following in order, smallest first :-

   a 0·5, 47%, $\frac{24}{50}$, 0·49 b 45% of £72, $\frac{2}{3}$ of £48, 0·04 x £804.

Percentages

Revisit - Review - Revise Exercise 6a

1. Change each of the following into a fraction in its simplest form :-

a 50%	b 25%	c 75%	d 33·333....%
e 60%	f 70%	g 5%	h 77%.

2. Change each of the following to a percentage :-

a 0·43	b 0·09	c 0·3	d 0·225
e $\frac{2}{3}$	f $\frac{4}{5}$	g 1·25	h $1\frac{1}{2}$.

3. a David gets a 10% **increase** on his £1640 monthly wage.
   How much does he now earn ?

   b Angela has her £640 weekly wage **decreased** by 15%.
   How much is her weekly wage now ?

Revisit - Review - Revise Exercise 6b

1. Find using a calculator :- (Show all your working)

a 27% of 2300 km	b 57% of 18 kg	c 13% of 608 m
d 27·5% of £1100	e 0·3% of $4500	f 105% of €400
g 0·75 x £340	h 0·1 x 550 kg	i 0·005 x 8600
j $\frac{2}{3}$ of $810	k $\frac{4}{5}$ of 8855 m	l $\frac{12}{13}$ of 520 km.

2. Keith earns £18 400 per annum as a plumber.
   How much would he earn if his salary was :-

   a increased by 17% b decreased by 9·5% ?

3. 

   SpotsAlive buy football strips for £25.
   They intend to sell them at a profit of 28%.
   How much should they sell each strip for ?

4. A car costs £8600 cash.
   VirgoCars let you pay a 16% deposit and
   36 monthly payments of £224·35.
   How much cheaper is it to pay cash ?

Answers

Answers to Chapter 6

Exercise 1 - Percentages - No Calculator

1. a £2·40 b £126 c $11 c 230 kg
   d £8 e 37·5 m g 26 km h $30
   i 21p j 1540 k 4 cm l €245
2. a £192 b 178·5 km
3. a £240 b £120 c £60
4. a 175 b 25

Exercise 2 - Percentages with a Calculator

1. a 31·28 km b 59·28 kg c 60·8 m
   d £269·50 e $7·56 f €5
   g £30·60 h 832·5 km i 37p
2. a (i) 68% (ii) 2176 b 20160 c 504
3. 69·76 kg
4. £3220

Exercise 3 - Linking Fractions, Decimals % %ages

1. a 66·7% b 14·3% c 78·9% d 177·5%
2. a Maths - 85%, English - 81·25%,
   French - 73·3%, Music - 70%
   b Maths (obviously)
3. a 47% - $^{24}/_{50}$ - 0·49 - 0·5
   b $^{2}/_{3}$ of £48 - 0·04 x £804 - 45% of £72

Review - Revisit - Revise Exercise 6a

1. a $^{1}/_{2}$ b $^{1}/_{4}$ c $^{3}/_{4}$ d $^{1}/_{3}$
   e $^{3}/_{5}$ f $^{7}/_{10}$ g $^{1}/_{20}$ h $^{77}/_{100}$
2. a 43% b 9% c 30% d 22·5%
   e 66·66..% f 80% g 125% h 150%
3. a £1804 b £544

Review - Revisit - Revise Exercise 6b

1. a £621 b 10·26 kg c 79·04 m
   d £302·50 e $13·50 f €420
   g £255 h 55 kg i 43
   j $540 k 7084 m l 480 km
2. a £21528 b £16652
3. £32
4. £852·60

Further Algebra

Exercise 1 — Solving Equations

1. Copy each equation and solve to find the value of x :-

a $x + 6 = 11$	b $x + 1 = 23$	c $x + 7 = 6$
d $x + 14 = 14$	e $x - 7 = 8$	f $x - 3 = 2$
g $13 + x = 17$	h $9 + x = 7$	i $17 - x = -17$.

2. Copy each equation and solve to find the value of the letter :-

a $4x = 12$	b $5p = 35$	c $6k = 24$
d $3h = 33$	e $4g = 56$	f $7n = 0$
g $4m = 144$	h $6c = 9$	i $8d = 1$.

3. Find the value of x in the following equations (*Set down ALL your working*).

a $2x + 6 = 14$	b $5x + 4 = 29$	c $4x + 7 = 39$
d $3x + 1 = 31$	e $4x - 8 = 16$	f $7x - 11 = 3$
g $10x - 9 = 41$	h $3x - 6 = 0$	i $11x - 7 = 37$
j $6x - 3 = 12$	k $8x + 12 = 15$	l $9x + 1 = 43$.

Exercise 2 — Harder Equations

1. Copy and complete :-

*(You may have been shown a different method)

a

$8x + 1 = 6x + 17$

$\Rightarrow 2x + 1 = \ldots.$

$\Rightarrow 2x = \ldots.$

$\Rightarrow x = \ldots.$

b

$7x - 3 = x + 15$

$\Rightarrow 7x - \ldots = \ldots.$

$\Rightarrow 7x = \ldots.$

$\Rightarrow x = \ldots.$

2. Solve these equations :-

a $5x + 4 = 2x + 19$	b $3x + 7 = x + 11$	c $8x + 6 = 7x + 22$
d $4x - 5 = x + 16$	e $11x - 1 = 2x + 17$	f $6x - 4 = 4x + 23$.

3. These equations are a little "different". Solve :-

a $5x = 4x + 3$	b $3x = x + 44$	c $7x = 4x + 42$
d $12x = 8x + 1$	e $15x = 3x + 18$	f $6x - 2 = 8x$.

4. Joe bought 5 bags of marbles. Harry bought 3 bags, but he already had 20 loose marbles. They then had exactly the same number of marbles.

a Make up an equation to show this information.

b Solve the equation to determine how many marbles there are in a bag.

Further Algebra

Exercise 3 Solving Equations with Brackets

1. Solve these equations by multiplying out the brackets first :-

   a $3(x+4)=21$ b $5(x+2)=80$ c $4(x-3)=28$

   d $9(x+2)=63$ e $8(x+7)=72$ f $3(x+3)=0$.

2. Solve these equations :-

   a $2(4x+2)=20$ b $3(2x-1)=21$ c $4(4x-5)=28$

   d $6(2x-1)=10x$ e $10(3x-3)=11x+8$ f $7(x+9)=6x$.

3. Solve :-

   a $2(x+4)-x-6=7$ b $3(x+1)+3x-8=13$

   c $4(x+2)-3x=14$ d $8(x-2)+2x+6=10$

   e $3(3x+2)+4(x-1)=6x+9$ f $2(5x-4)+6(x+1)=3x+24$

   g $3(x+7)-4(x+3)=10$ h $2(x-3)-3(x-4)=7$

   i $3(3x+1)-2(x-5)=x+37$ j $13(x+3)-2(3x+11)=2x+7$.

Answers

Ch 5 Ex 1 Solving Equations

1.	a	5	b	22	c	-1
	d	0	e	15	f	5
	g	4	h	-2	i	34
2.	a	3	b	7	c	4
	d	11	e	14	f	0
	g	36	h	$^{3}/_{2}$	i	$^{1}/_{8}$
3.	a	4	b	5	c	8
	d	10	e	6	f	2
	g	5	h	2	i	4
	j	$^{16}/_{6}$ = 2·5	k	$^{3}/_{8}$		
	l	$^{42}/_{9}$ = $^{14}/_{3}$ = 4 $^{2}/_{3}$				

Ch 5 Ex 2 Harder Equations

1.	a	8	b	3		
2.	a	5	b	2	c	16
	d	7	e	2	f	$^{27}/_{2}$
3.	a	3	b	22	c	14
	d	$^{1}/_{4}$	e	$^{18}/_{12}$ = 1·5	f	-1
4.	a	5x = 3x + 20			b	10

Ch 5 Ex 3 Solving Equations with Brackets

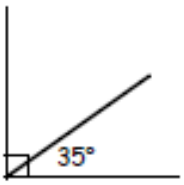
1.	a	3	b	14	c	10
	d	5	e	2	f	-3
2.	a	2	b	4	c	3
	d	3	e	2	f	-63
3.	a	5	b	3	c	6
	d	2	e	1	f	2
	g	-1	h	-1	i	4
	j	-2				

Angles

Exercise 1 Complementary & Supplementary Angles

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

a



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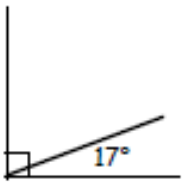

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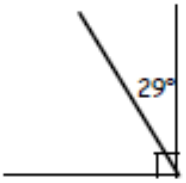

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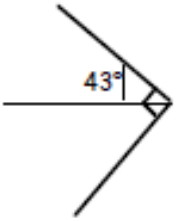

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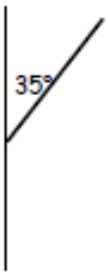

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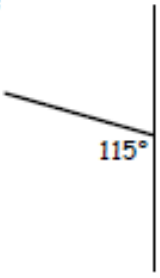

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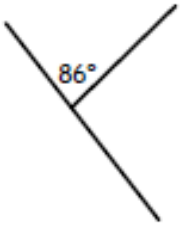

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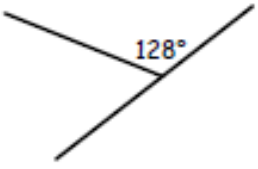

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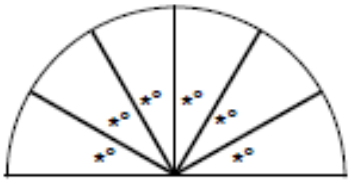


all equal angles

j

all angles equal

2. Write down the complement of :-

a 60° b 20° c 37° d 1°.

3. Write down the supplement of :-

a 30° b 110° c 77° d 9·5°.

4. What angle is its own :- a complement b supplement ?

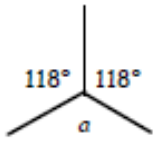
5. What is the **sum** of all the angles round a point ?

Angles

Exercise 2 Angles Round a Point

1. Calculate (do not measure) the sizes of the angles marked *a*, *b*, *c*, ...

a



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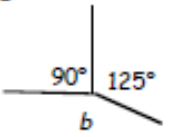

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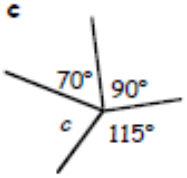

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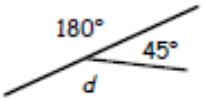

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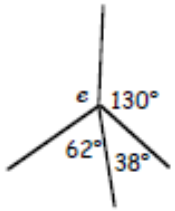

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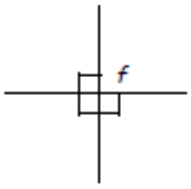

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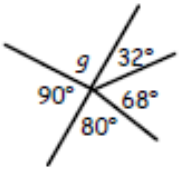

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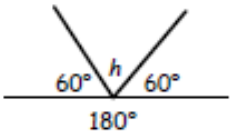

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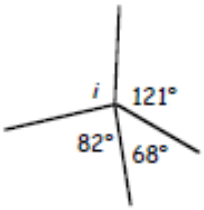

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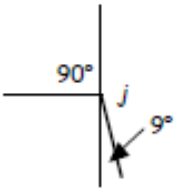

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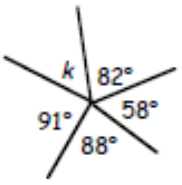

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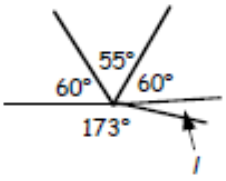
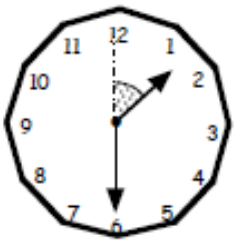


2. An arrow lands on a target as shown.
Calculate the size of the shaded angle.

3. 

This clock shows a time of 1.30.
Calculate the size of the shaded angle.

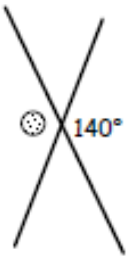
4. Five angles round a point are 39°, 122°, 77°, and two unknown **equal** angles.
Find one of the unknown angles.

Anales

Exercise 3 Vertically Opposite Angles

1. Write down the sizes of all the angles marked with a ⊛ .

a



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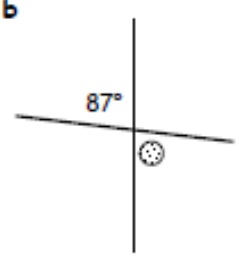

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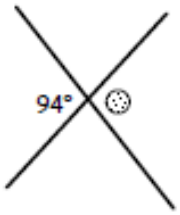

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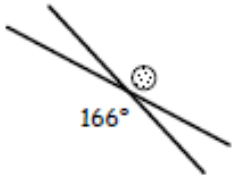

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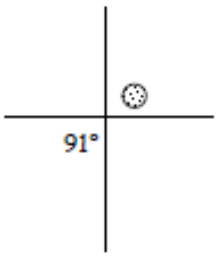

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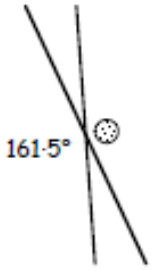

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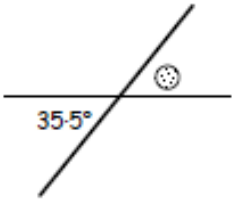
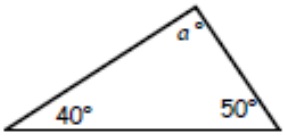


2. Sketch all the diagrams above and fill in **all** the missing angles.

Exercise 4 Angles in a Triangle

1. Calculate the size of the angles marked *a*, *b*, *c*, ...

a



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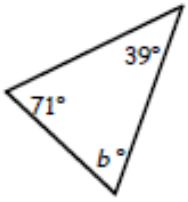

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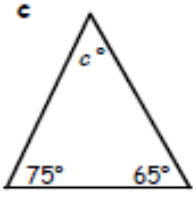

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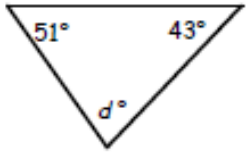

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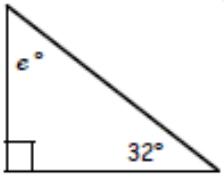
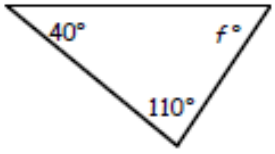
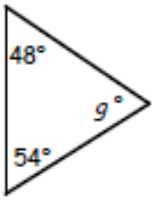


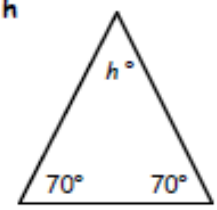
f



g



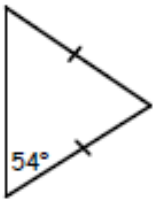
h



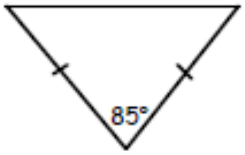
Angles

2. Copy each diagram below and fill in all the missing angles :-

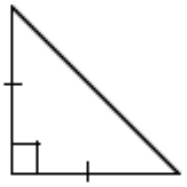
a



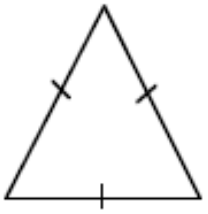
b



c

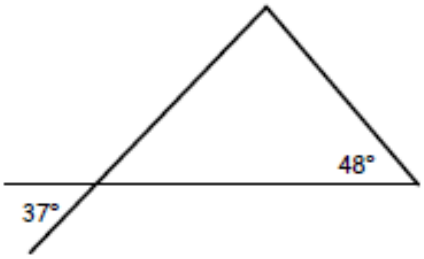


d

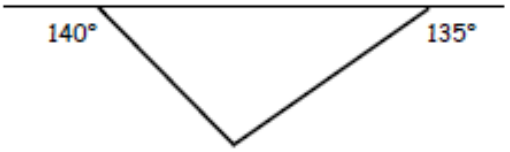


3. Copy each diagram below and fill in **all** the missing angles :-

a



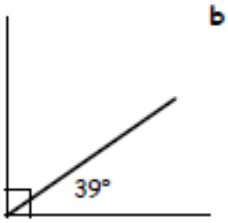
b



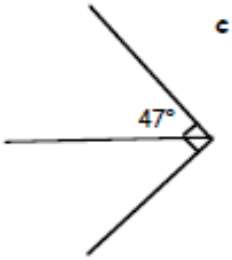
Exercise 5 Angles Mixed Exercise

1. Copy all the diagrams below filling in **all** missing angles :-

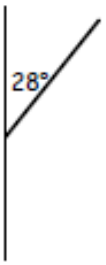
a



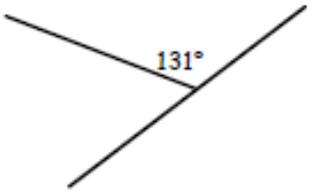
b



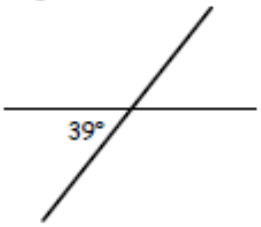
c



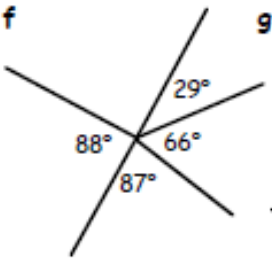
d



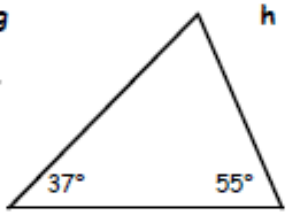
e



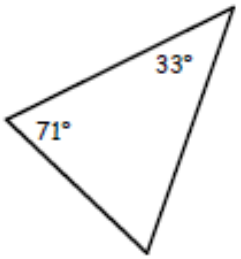
f



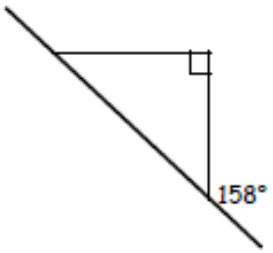
g



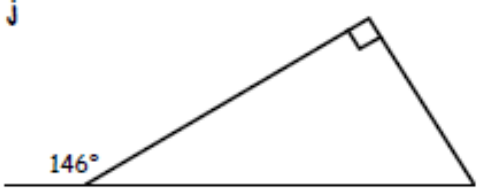
h



i



j



Answers

Answers to Chapter 3

Exercise 1 – Complementary & Supplementary Angles

1. a 55° b 73° c 61° d 47°
   e 145° f 65° g 94° h 52°
   i 30° j 22·5°
2. a 30° b 70° c 53° d 89°
3. a 150° b 70° c 103° d 170·5°
4. 45° b 90°
5. 360°

Exercise 2 – Angles Round a Point

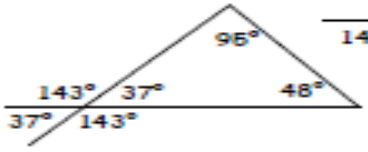
1. a 124° b 145° c 85° d 135°
   e 130° f 90° g 90° h 60°
   i 89° j 171° k 41° l 12°
2. 108°
3. 45°
4. 61°

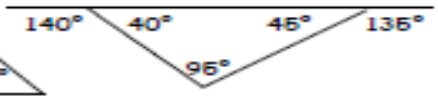
Exercise 3 – Vertically Opposite Angles

1. a 140° b 87° c 94° d 166°
   e 91° f 161·5° g 90° h 35·5°
2. See drawings

Exercise 4 – Angles in a Triangle

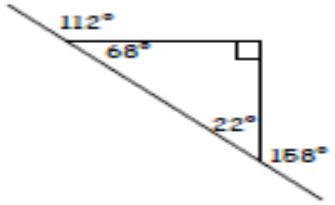
1. a 90° b 70° c 40° d 86°
   e 58° f 30° g 78° h 40°
2. a 54°, 72° b 47·5°, 47·5°
   c 45°, 45° d 60°, 60°, 60°
3. a b

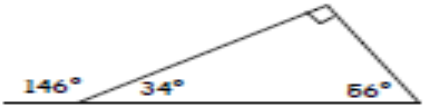




Exercise 5 – Mixed Exercise

1. a 51° b 43° c 152° d 49°
   e 39°,141° f 90° g 88° h 76°
   i j





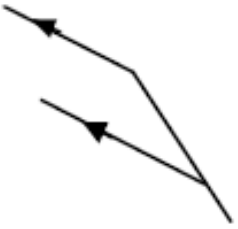
More Angles

Exercise 1 Corresponding Angles

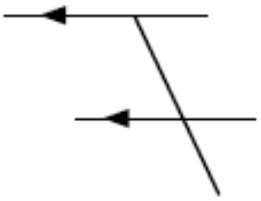
1. Copy and complete :- Corresponding (F) angles are e.....

2. Copy the diagrams and mark all the corresponding (F) angles with a * :-

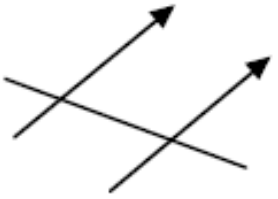
a



b

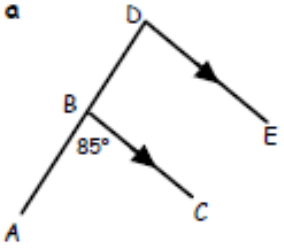


c

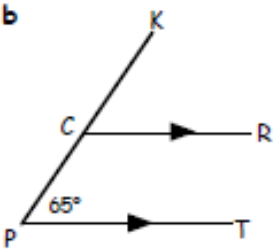


3. Write down the sizes of all the angles in the following diagrams :- ($\angle ABC = 85°$).

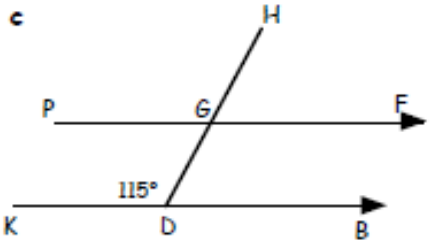
a



b

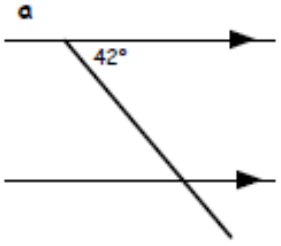


c

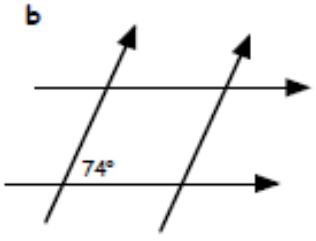


4. Sketch each of the following and fill in all the missing angles :-

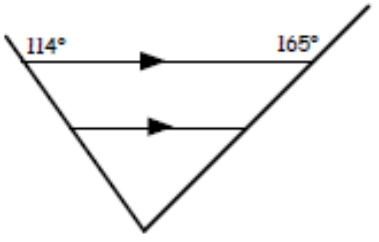
a



b



c

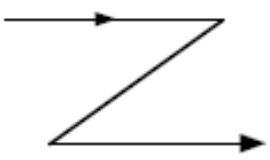


Exercise 2 Alternate Angles

1. Copy and complete :- Alternate (Z) angles are e.....

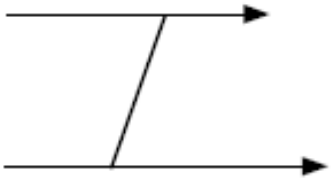
2. Copy the diagrams and mark all the alternate (Z) angles with a * :-

a



b

c

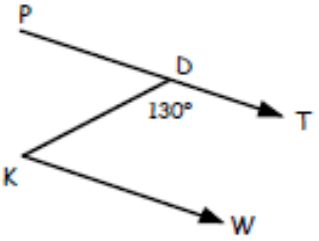


More Angles

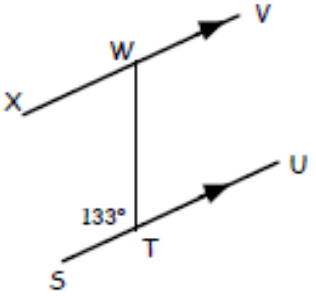
3. Write down all the sizes of the angles in the following diagrams :- (e.g. $\angle ABC = 69°$).

a

b

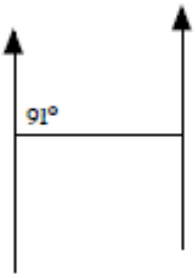


c

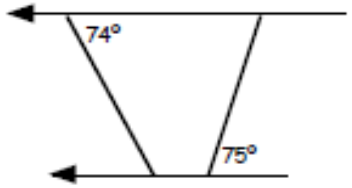


4. Sketch each of the following and fill in all the missing angles :-

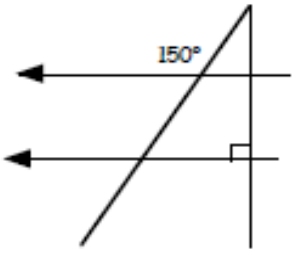
a



b



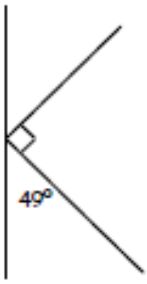
c



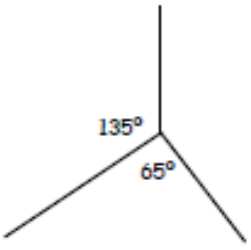
Exercise 3 Mixed Exercise

1. Make a neat rough sketch of each of the following diagrams.
   Fill in all the missing angles.

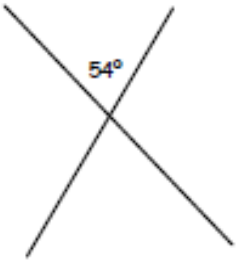
a



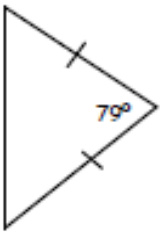
b



c

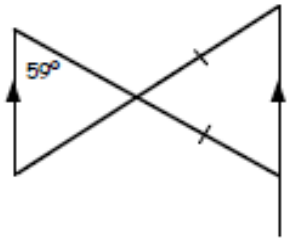


d

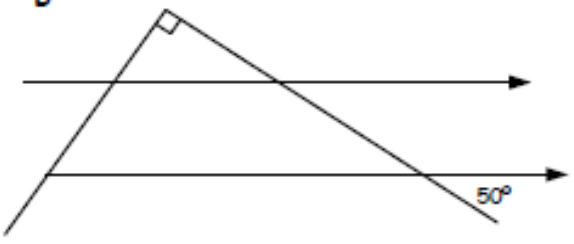


2. Sketch each of the following and fill in all the missing angles :-

a



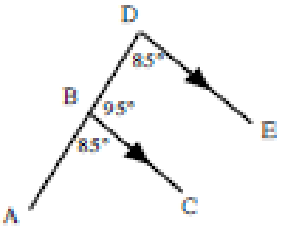
b

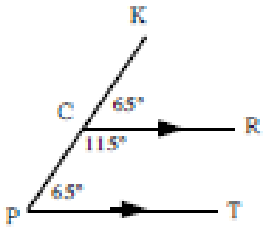


Answers

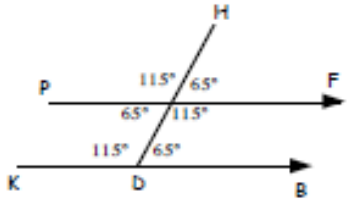
Ch 6 Ex 1 Corresponding Angles

1. equal
2. Check diagrams
3. a b

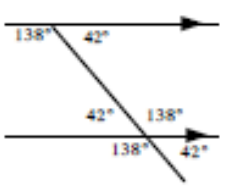


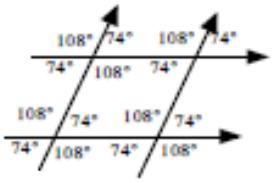


c

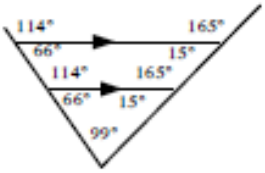


4. a b



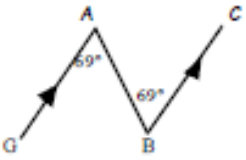


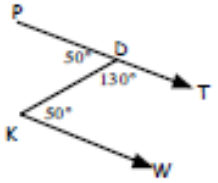
c



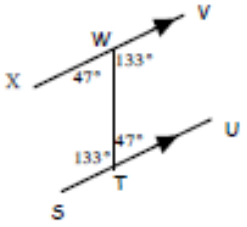
Ch 6 Ex 2 Alternate Angles

1. equal
2. check diagrams
3. a b

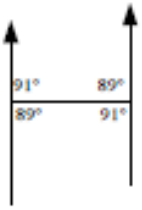


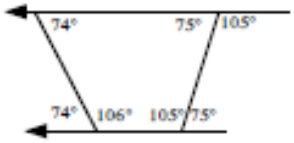


c



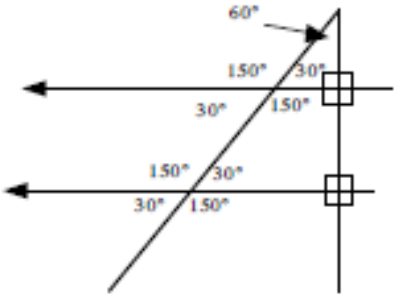
4. a b





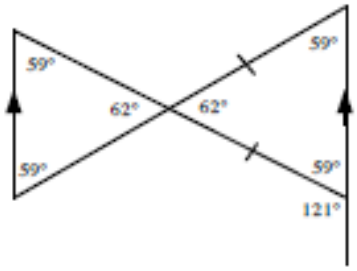
Answers

c

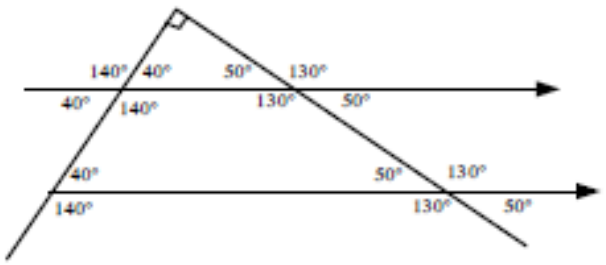


Ch 6 Ex 3 Mixed Exercise

1. a 41° b 160°
   c 54°, 126°, 126° d 50·5°, 50·5°
2. a



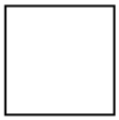
b

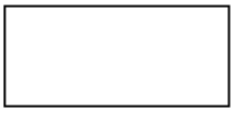


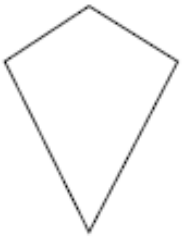
Symmetry

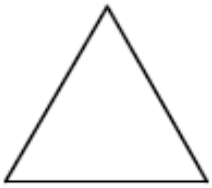
Exercise 1 Line Symmetry

1. Make a neat tracing of each of the following shapes.

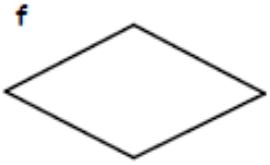
a 

b 

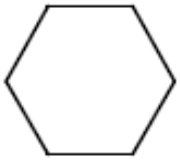
c 

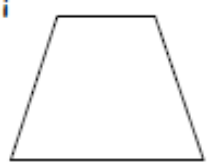
d 

e 

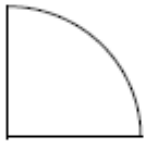
f 

g 

h 

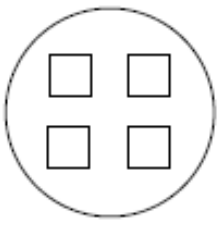
i 

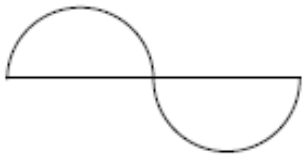
j 

k 

l 

m 

n 

o 

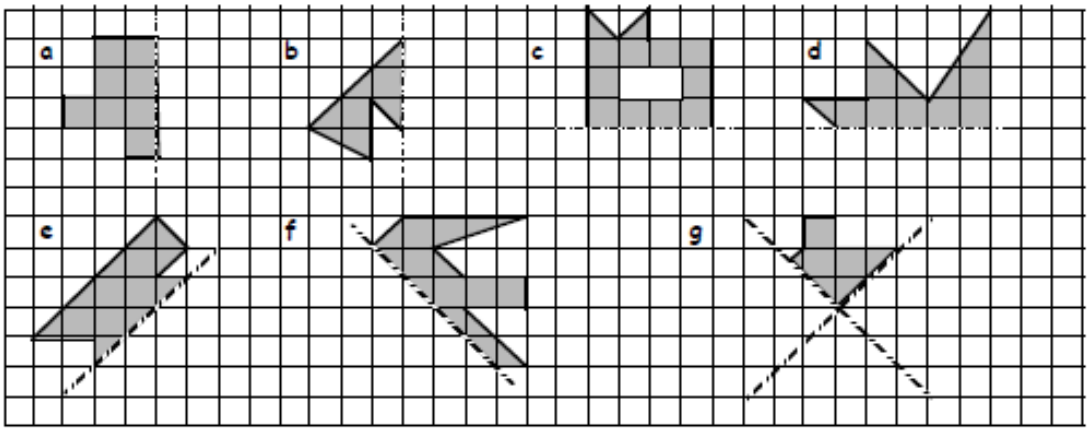
2. a For each shape you have traced (or copied) show all lines of symmetry.
   b Write down next to each shape how many lines of symmetry it has.

3. Make a list of those capital letters of the alphabet that have lines of symmetry.

A B C .....

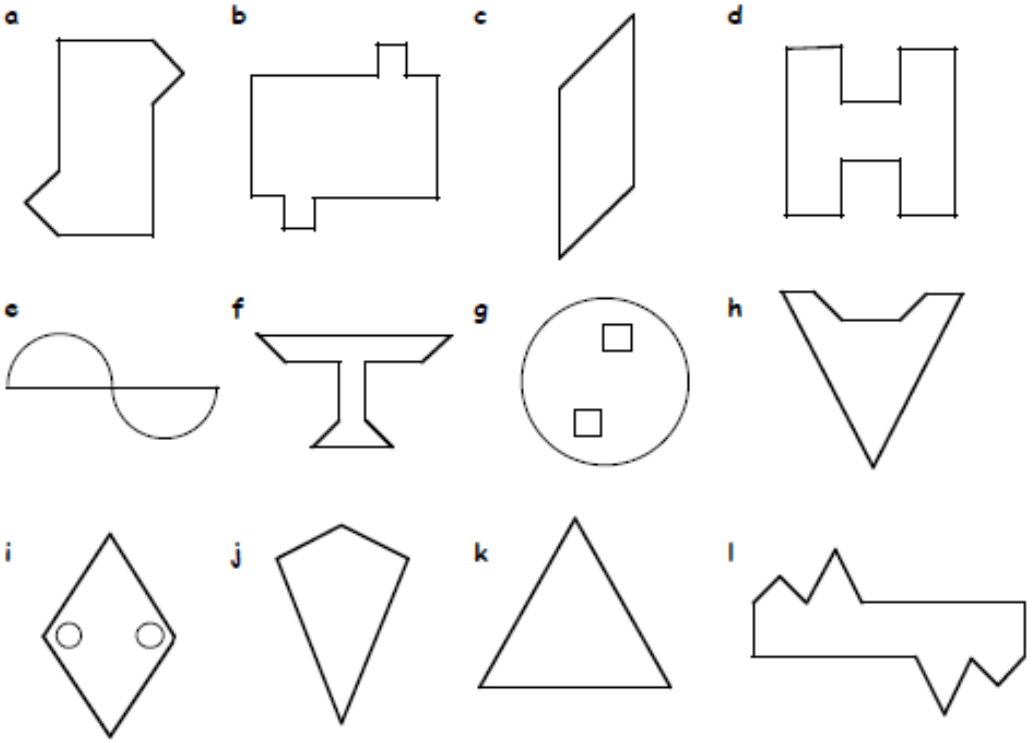
Symmetry

4. Copy each of the following shapes neatly and complete each one such that the **dotted** line is a line of symmetry each time.



Exercise 2 Rotational Symmetry

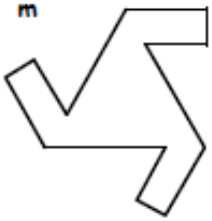
1. Which of the following shapes have **half-turn** symmetry ? (Answer **yes** or **no**).



continues over the page ...

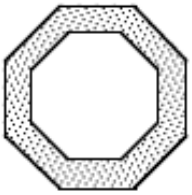
Symmetry

m

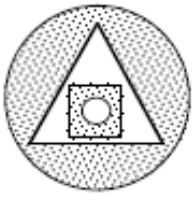


n

o



p



2. For each shape in Question 1, state the **order** of symmetry.

3. a Which seven capital letters of the alphabet have $\frac{1}{2}$-turn symmetry ?

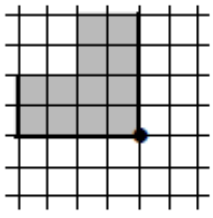
A B C .....

b Of these seven letters, only three do **not** have a line of symmetry.
Which three ?

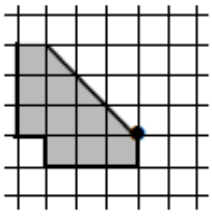
Exercise 3 Creating a Shape with Half-turn Symmetry

1. Make a copy of each of the following shapes.
Create a shape which has half turn symmetry by rotating each shape by 180° about the dot.

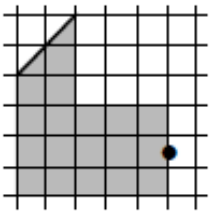
a



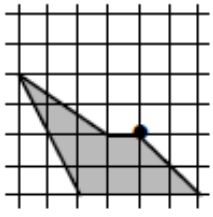
b



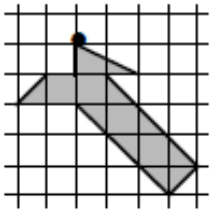
c



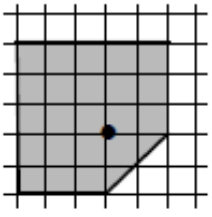
d



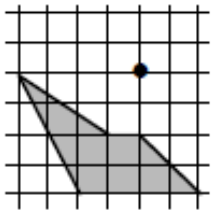
e



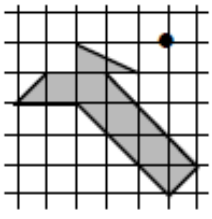
f



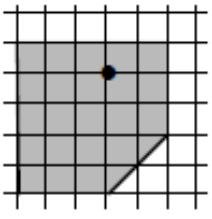
g



h



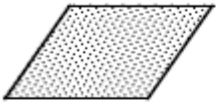
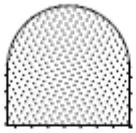
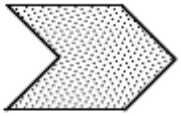
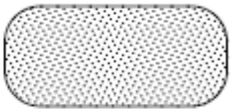
i

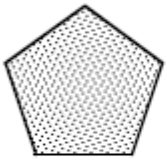
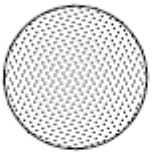
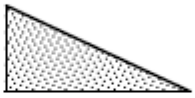
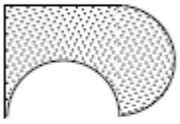


Symmetry

Exercise 4 Translation (Slide) Symmetry

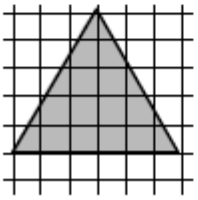
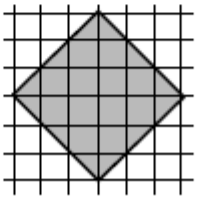
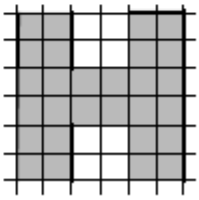
1. Which of the following shapes would **not** "tile the plane".

a  b  c  d 

e  f  g  h 

2. a Draw each shape shown below and shade it in.

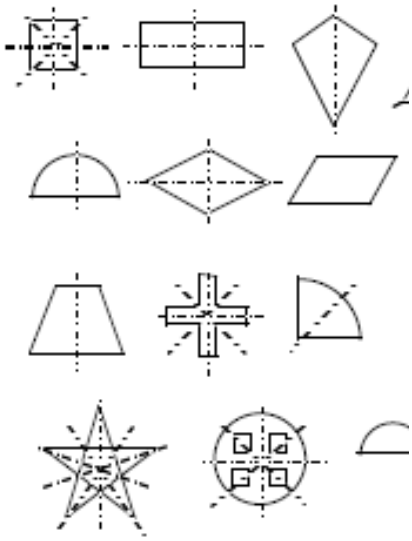
   b Tile the plane using 6-8 congruent tiles

(i)  (ii)  (iii) 

Answers

Ch 11 Ex 1 Line Symmetry

1.

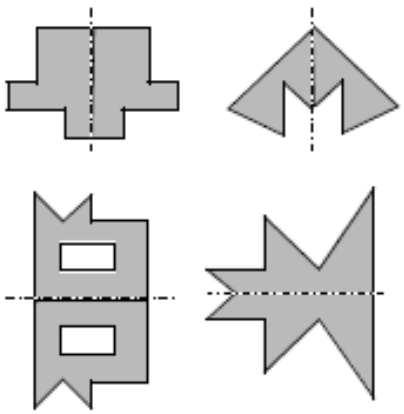


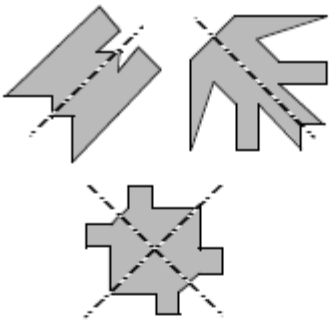
2.

a	4	b	2	c	1
d	3	e	1	f	2
g	0	h	6	i	1
j	4	k	1	l	1
m	5	n	4	o	0

3. A, B, C, D, E, H, I, K, M, O, (Q), T, U, V, W

4.





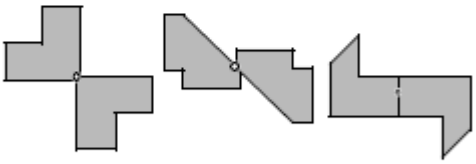
Ch 11 Ex 2 Rotational Symmetry

1.	a	yes	b	yes	c	yes
	d	yes	e	yes	f	no
	g	yes	h	no	i	yes
	j	no	k	no	l	yes
	m	no	n	yes	o	yes
	p	no				
2.	a	$\frac{1}{2}$, 2	b	$\frac{1}{2}$, 2	c	$\frac{1}{2}$, 2
	d	$\frac{1}{2}$, 2	e	$\frac{1}{2}$, 2	f	--
	g	$\frac{1}{2}$, 2	h	--	i	$\frac{1}{2}$, 2
	j	--	k	$\frac{1}{3}$, 3	l	$\frac{1}{2}$, 2
	m	$\frac{1}{3}$, 3	n	$\frac{1}{6}$, 6	o	$\frac{1}{8}$, 8

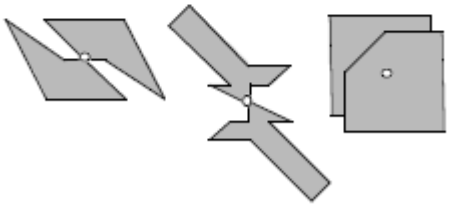
3. a H, I, N, O, S, X, Z b N, S, Z

Ch 11 Ex 3 Half-turn Symmetry

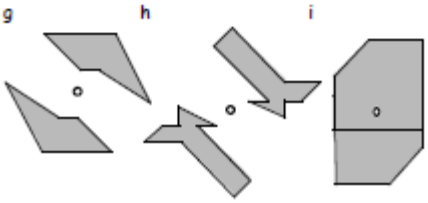
1. a b c



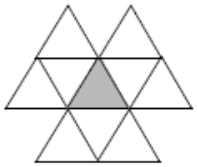
d e f



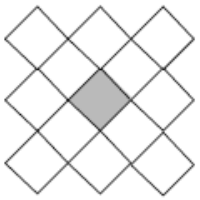
g h i



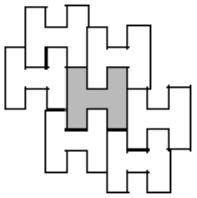
1. b d f
2. (i)



(ii)



(iii)

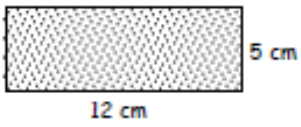


Area/Perimeter

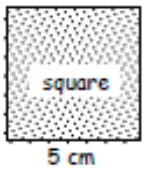
Exercise 1 Perimeter & Area

1. Calculate :- (i) the perimeter (ii) the area of each shape below :-

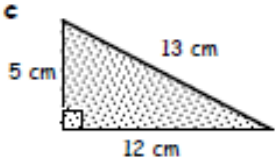
a



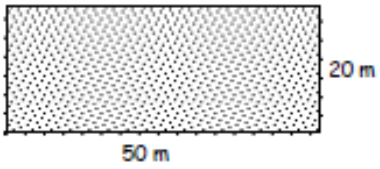
b



c

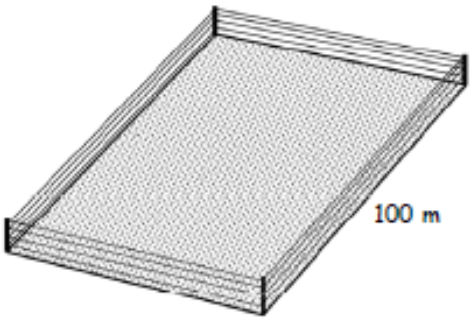


d



e

2. Four strips of electrical wire fence surround a rectangular field with area 8000 square metres.



a Find the width of the field given that the length is 100 metres.

b What is the total length of wire needed ?

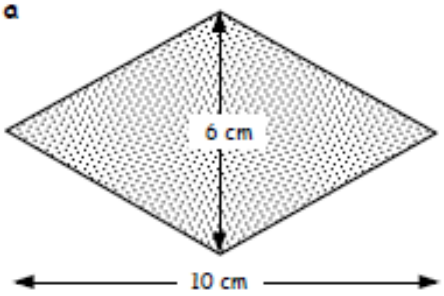
c The wire costs 18p per metre.

How much will the wire cost in total ?

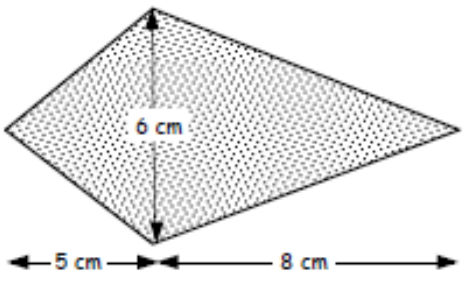
Exercise 2 Area of a Rhombus & Kite

1. Using $A = \frac{1}{2}(D \times d)$, calculate the **area** of each rhombus and kite below :-

a

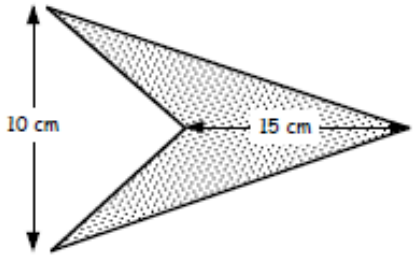


b

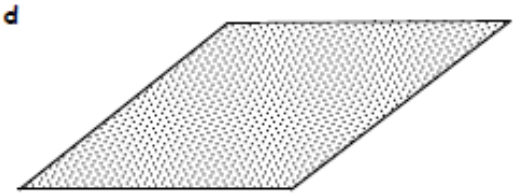


Area/Perimeter

1. c



d

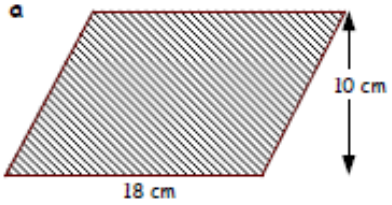


Rhombus with diagonals 12 cm and 9 cm

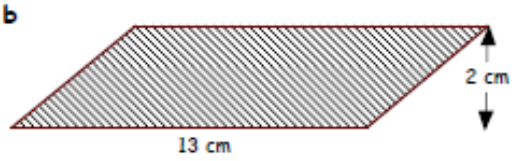
Exercise 3 Area of a Parallelogram

1. Using $A = B \times H$, calculate the **area** of each parallelogram below :-

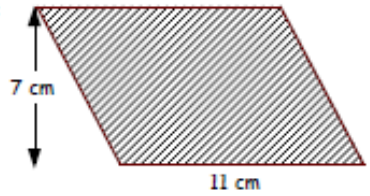
a



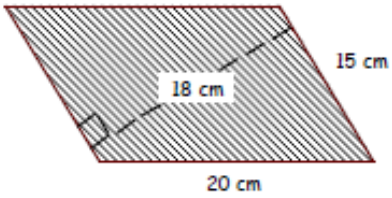
b



c



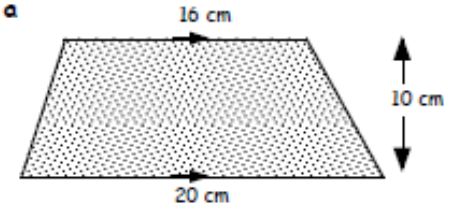
d



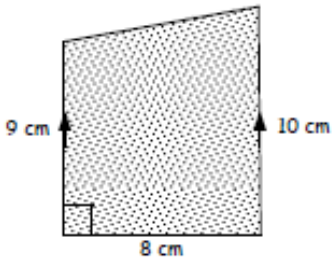
Exercise 4 Area of a Trapezium

1. Calculate the **area** of each trapezium below :-

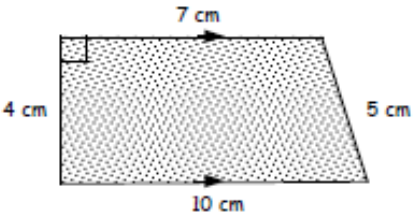
a



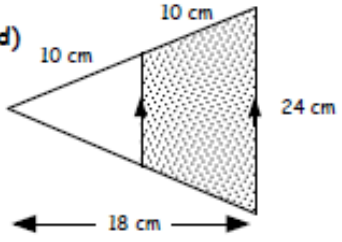
b



c



d (Hard)

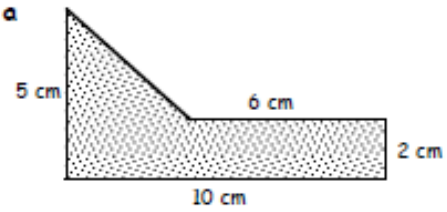


Area/Perimeter

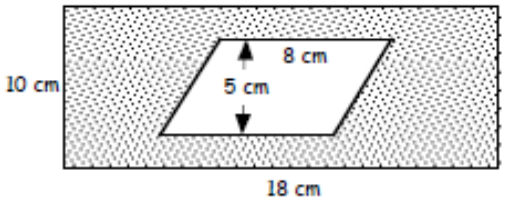
Exercise 5 Composite Areas

1. Calculate the **area** of each composite shape below :-

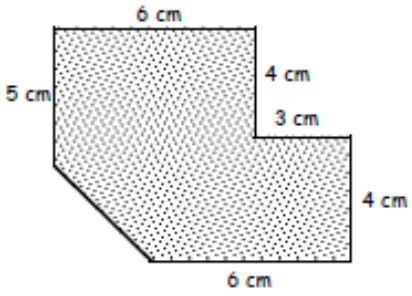
a



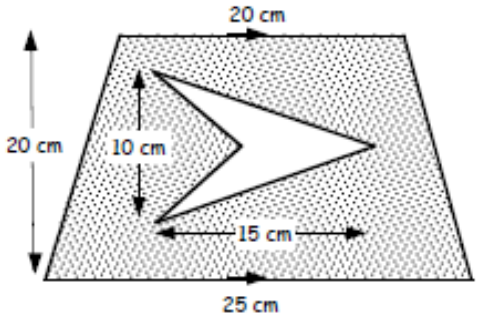
b



c



d



Answers

Exercise 1 - Perimeter & Area

1. a (i) 34 cm (ii) 60 cm^2
   b (i) 20 cm (ii) 25 cm^2
   c (i) 30 cm (ii) 30 cm^2
   d (i) 140 m (ii) 1000 m^2
   e (i) 440 cm (ii) 4000 cm^2
2. a 80 m b 1440 m c £259·20

Exercise 2 - Area of a Rhombus & Kite

1. a 30 cm^2 b 39 cm^2 c 75 cm^2 d 54 cm^2

Exercise 3 - Area of a Parallelogram

1. a 180 cm^2 b 26 cm^2 c 77 cm^2 d 270 cm^2

Exercise 4 - Area of a Trapezium

1. a 180 cm^2 b 76 cm^2 c 34 cm^2 d 162 cm^2

Exercise 5 - Composite Area

1. a 26 cm^2 b 140 cm^2 c 55·5 cm^2 d 375 cm^2

Statistics

Exercise 13.1

1. Find the **range** for each set of numbers :-

   a 3, 5, 6, 6, 11, 22. b 4, 11, 56, 12, 9, 14. c 10, 0, 45, 32, 3.

2. Write down the **mode** for each set of numbers :-

   a 1, 3, 3, 4, 5, 7, 9. b 16, 23, 25, 46, 23, 61. c 3, 3, 7, 5, 6, 5, 5.

3. Work out the **median** of each set of numbers :-
   (*Remember you might need to put them in order*).

   a 2, 5, 8, 9, 12, 14, 15. b 11, 14, 12, 17, 13. c 2, 7, 3, 4, 1, 1, 5, 8.

4. Calculate the **mean** for each set of numbers in question 3.

5. Calculate the **range**, **mean**, **median** and **mode** of this set of numbers :-

   3, 5, 8, 11, 16, 20, 20, 30

6. Mr. Francis has vitamin pill boxes. The labels read "average contents 54 pills".
   He opened 10 of the boxes and counted the contents of each box.

   50, 52, 58, 57, 57, 48, 52, 54, 60, 52.

   a Find the **mean**, **median** and **mode**.

   b State whether the box's label is correct. Explain.

Answers

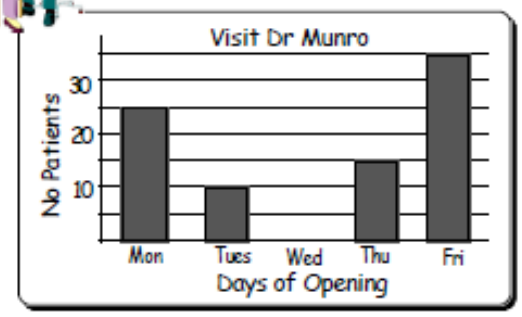
Exercise 13.1

1. a 19 b 52 c 45
2. a 3 b 23 c 5
3. a 9 b 13 c 3·5
4. a 9 b 13 c 4
5. range 27, mean 14, median 13·5, mode 20

More Statistics

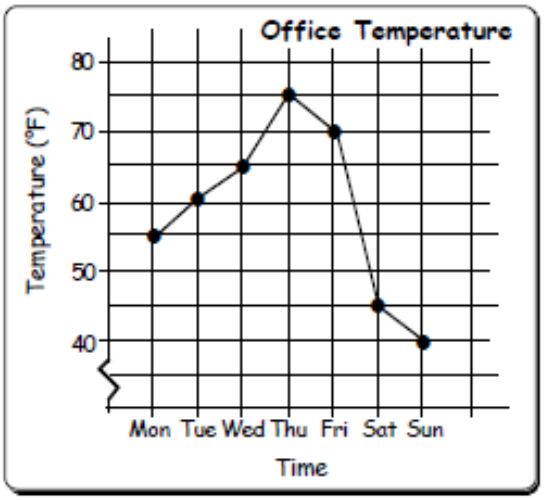
Exercise 12.1

1. The **bar graph** shows the number of patients who visited Dr Munro last week, during the days which the surgery was open.



   a. How many patients did Dr Munro see on :-
      (i) Tuesday (ii) Thursday ?
   b. How many patients did he see **in total** that week ?
   c. Which day is his day off ? Explain.
   d. How many **more** patients did he see on Friday than on Monday ?
   e. His surgery was busy on Monday and Friday. Suggest a reason for this.

2. The **line graph** shows the daily temperatures taken in an office at 4 pm each day.



   a. What was the 4 pm temperature on :-
      (i) Monday (ii) Saturday ?
   b. One day was particularly hot in the office.
      Which day do you think this was ?
   c. Suggest a reason for the large drop in temperature from Friday to Saturday.
   d. (i) On what day was the lowest recorded temperature ?
      (ii) Why do you think this day had the lowest temperature ?

3. Construct a **line graph** similar to Qu. 2 for the daily temperatures recorded in another office at 5 pm each day.

   The temperatures are shown in the table.

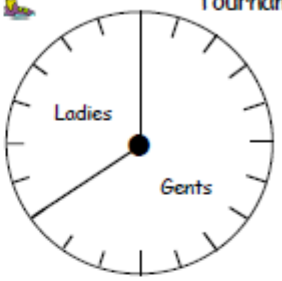
Mon	Tues	Wed	Thurs	Fri	Sat	Sun
40°	60°	75°	70°	65°	50°	40°

More Statistics

Exercise 12.2

1. The **pie chart** shows how many ladies and gents took part in a tennis tournament last Saturday.
The chart is divided into 20 equal sectors.

Tennis Tournament



a What **fraction** does each sector stand for ?

b What % does each sector represent ?

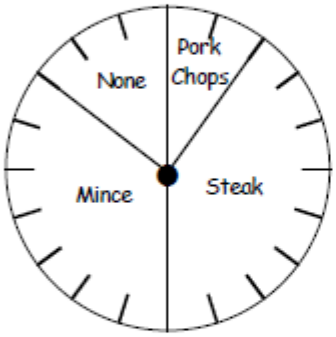
c What fraction of the tennis players were ladies ?

d What fraction were men ?

60 people in total played in the tournament.

e How many **ladies** and how many **gents** were there ?

2.



240 fifth year pupils were asked what their favourite meat dish was.

The results are shown in the **pie chart**.

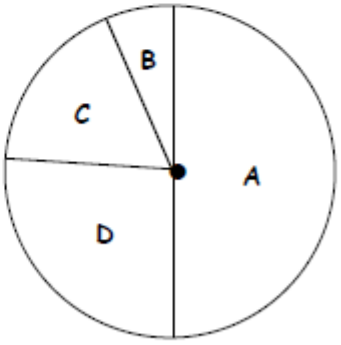
a How many pupils chose Pork Chops ?

b How many pupils chose Steak ?

c How many pupils did **not** like any of these types of meat ?

3. A plant mail order company recorded the number of complaints reported to them :-

- 50% of plants had withered on transit
- 27% had been eaten by bugs
- 14% had gone missing in the post
- the **rest** had broken stems.



a What percentage had broken stems ?

b Write down which sector represents which category of complaint.

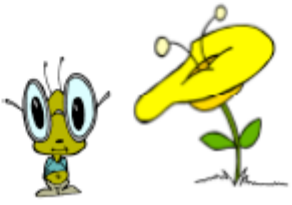
1000 complaints were made by customers altogether.

How many of them complained about :-

c withered plants ?

d plants gone missing in the post ?

e broken stems ?



Answers

Exercise 12.1

1. a (i) 10 (ii) 15
   b 85 c Wed (no patients)
   d 10 e before/after weekend
2. a (i) 55°F (ii) 45°C

Exercise 12.2

1. a $\frac{1}{20}$ b 5% c $\frac{7}{20}$
   d $\frac{13}{20}$ e 21 ladies, 39 gents
2. a 24 b 96 c 36
3. a 9%
   b A : withered, B : broken stems
   C : no posts D : bugs
   c 500 d 140 e 90

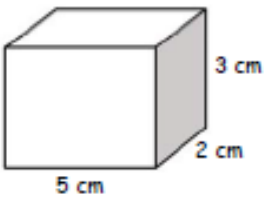
3D Shapes

Exercise 1 Volumes of Cubes & Cuboids

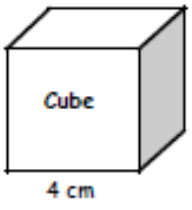
1. Copy and complete :- Volume = length x br..... x h.....

2. Use the formula to calculate the **volume** of the following cuboids :-

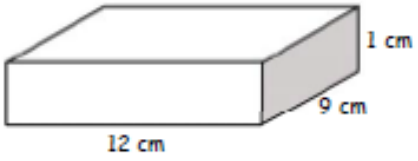
a



b

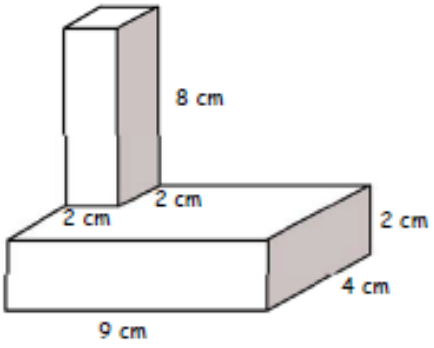


c

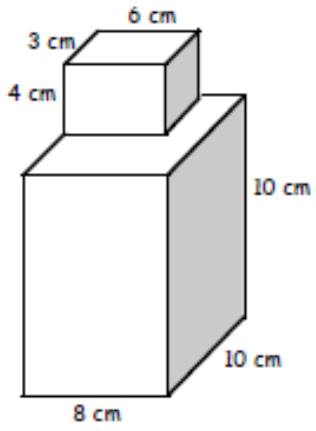


3. Find the total **volume** of each of the following shapes :-

a

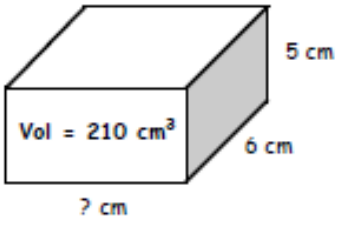


b

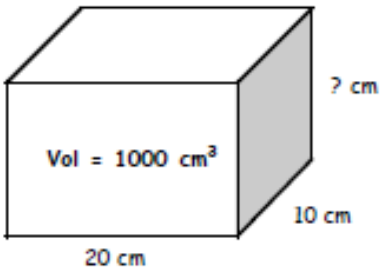


4. Calculate the length of the missing edge of each of the following cuboids :-

a



b



3D Shapes

Exercise 3 Liquid Volume - Capacity 

1. Change each of the following to millilitres :-

   a 3 litres b 10 litres c 1·5 litres d 10·1 litres

   e half a litre f 5·12 litres g $^3/_4$ litre h 0·02 litres.

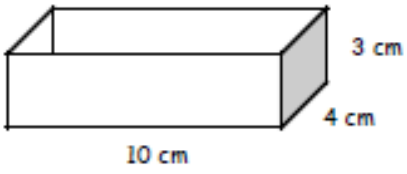
2. Change each of the following to litres :-

   a 8000 ml b 100 000 ml c 7500 ml d 1250 ml

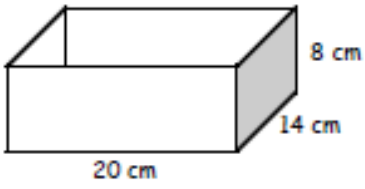
   e 10 010 ml f 300 ml g 50 ml h 8 ml.

3. Find the capacity (in millilitres) of each of these containers :-

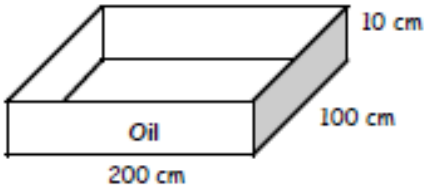
   a



   b



4. How many **litres** would it take to **half fill** the oil tray shown ?



Answers

Exercise 1 – Volumes of Cubes & Cuboids

1. $V = L \times B \times H$
2. a 30 cm^3 b 64 cm^3 c 108 cm^3
3. a 104 cm^3 b 872 cm^3
4. a 7 cm b 5 cm

Exercise 3 – Liquid Volume – Capacity

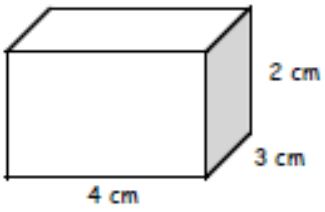
1. a 3000 ml b 10000 ml
   c 1500 ml d 10100 ml
   e 500 ml f 5120 ml
   g 750 ml h 20 ml
2. a 8 l b 100 l c 7·5 l d 1·25 l
   e 10·01 l f 0·3 l g 0·05 l h 0·008 l
3. a 120 ml b 2240 ml
4. a 100 litres

More 3D Shapes (No Answers)

Exercise 1

Remember :- To calculate the **surface area**, you find the area of each face and add them together.

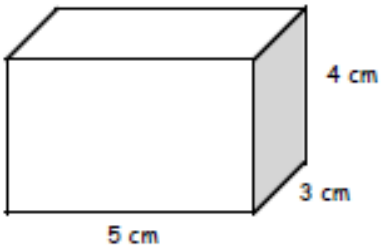
1. Copy and complete to find the total **surface area** of this cuboid.



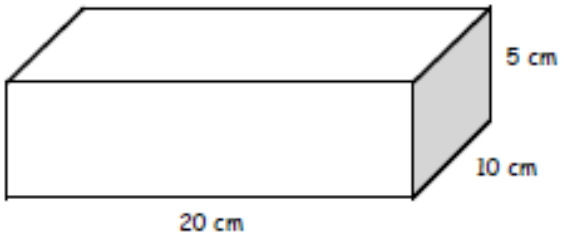
Area of front	= $l \times b$	= 4 cm × 2 cm	= 8 cm^2
Area of back		= same	= 8 cm^2
Area of top	= $l \times b$	= 4 cm × 3 cm	= 12 cm^2
Area of bottom		= same	= .... cm^2
Area right side	= $l \times b$	= ... cm × ... cm	= .... cm^2
Area left side		= same	= .... cm^2
		Total Surface Area	= ....cm^2

2. Find the total surface area of these cuboids. (*Show your working*).

a

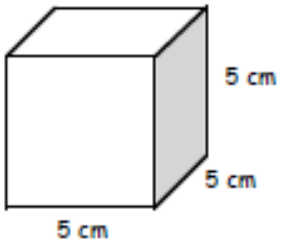


b



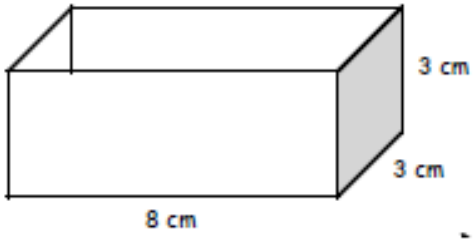
3. A cube has side 5 centimetres.

Find the total surface area of the cube.



4. This carton has **no lid**.

Find the surface area of the outside of the carton.

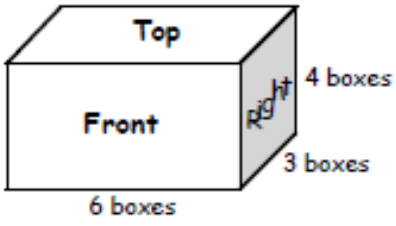


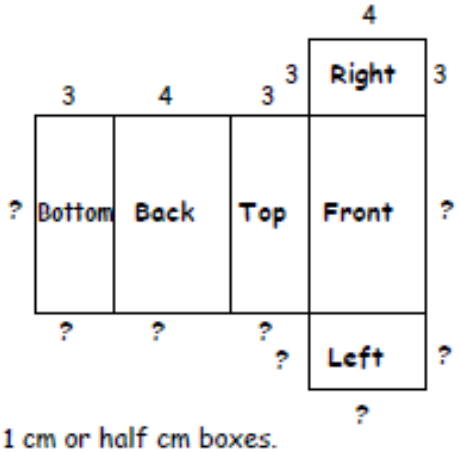
More 3D Shapes (No Answers)

Exercise 2

1. Shown is a net of a cuboid.

   Copy the net and complete the unknown lengths.

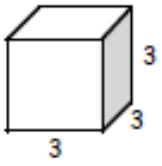




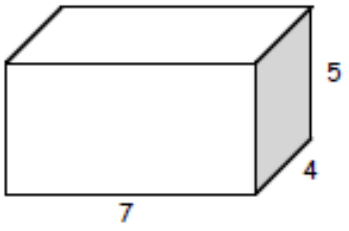
2. For each of the following :- (i) draw a net using 1 cm or half cm boxes.

   (ii) calculate the surface area using the net to help you.

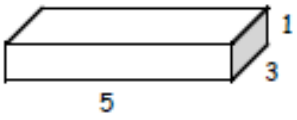
a



b



c



Patterns

Exercise 1 — Sequences & Patterns

1. Give a rule for each of these sequences :- (*begin with " start at ... and then ....."*).

   a 2, 5, 8, 11, 14, ... b 7, 13, 19, 25, ... c 25, 20, 15, 10, ...

   d 98, 81, 64, 47, ... e 3, 9, 27, 81, ... f 1, 6, 36, 216, ...

2. Write down the next two numbers in each sequence from question 1.

3. Find the next two numbers in each sequence :-

   a 7, 9, 11, 13, ... b 5, 9, 13, 17, ... c 24, 22, 20, ...

   d 70, 58, 46, 34, ... e 1, 3, 9, ... f 2, 4, 8, 16, ...

4. Shown is the pattern for **square numbers**.
   Write down the first 12 square numbers.

5. A pattern of numbers is defined as :- (2 x 3), (3 x 4), (4 x 5), (5 x 6) ....

   Write down the :- a 10^{th} term b 1000^{th} term c n^{th} term.

Exercise 2 — Simple Linear Patterns

1. Each door has six window panes.

   a Copy and complete the table.

   b Copy and complete the formula :- P = ... x D

   c How many panes would there be in 11 doors ?

   d How many doors are there if there are 78 panes ?

No. of Doors (D)	1	2	3	4	5
No. of Panes (P)	6	12	?	?	?
rises by : →		6	6	?	?	?

2. For the tables below :- (i) complete each one (ii) construct a formula.

   a No. of toys and price

T	1	2	3	4	5	6
P	9	18	27	..	..	..

P = ... x T

   b No. of seconds and no. of minutes

M	1	2	3	4	5	6
S	60	120	180	..	..	..

S = ... x M

   c No. of pentagons and no. of vertices

P	1	2	3	4	5	6
V	5	10	15	..	..	..

   d No. of tables to legs

T	1	2	3	4	5	6
L	8	16	24	..	..	..

Patterns

3. **Linear Graphs** – For each of the tables below :-

(i) complete each table (ii) construct a formula

(iii) take each pair of numbers as coordinates (iv) plot on a coordinate graph

(v) draw a line through the points and label the line with your formula.

a

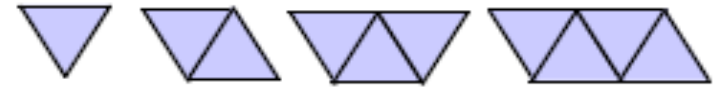
x	0	1	2	3	4	5
y	0	3	6	9	..	..

b

x	0	1	2	3	4	5
y	0	2	4	6	..	..

Exercise 3 Harder Linear Patterns

1. Look at the pattern shown.



a Copy and complete the table shown.

No. of triangles (T)	1	2	3	4	5	6
Perimeter (P)	3	4	5	..	..	..

1 1 1

b Copy and complete the formula for the above pattern :- P = ... x T + ...

c Find the perimeter of the pattern with 21 triangles.

d Find the number of triangles if the perimeter is 27.

2. For each of the tables below :-

(i) complete each table (ii) construct a formula.

a

x	0	1	2	3	4	5
y	3	5	7	9	..	..

b

x	0	1	2	3	4	5
y	5	6	7	8	..	..

c

x	0	1	2	3	4	5
y	-2	1	4	7	..	..

d

x	0	1	2	3	4	5
y	-1	4	9	14	..	..

e

x	-2	-1	0	1	2	3
y	..	-4	-2	0	2	...

f

x	-2	-1	0	1	2	3
y	...	-11	-4	3	...	...

Answers

Ch 4 Ex 1 Sequences & Patterns

1. a start at 2 then add 3
   b start at 7 then add 6
   c start at 25 then subtract 5
   d start at 98 then subtract 17
   e start at 3 then times by 3
   f start at 1 then times by 6
2. a 17, 20 b 31, 37 c 5, 0
   d 30, 13 e 243, 729 f 1296, 7776
3. a 15, 17 b 21, 25 c 18, 16
   d 22, 10 e 27, 81 f 32, 64
4. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144
5. a 11×12 b 1001×1002 c $(n+1) \times (n+2)$

Ch 4 Ex 2 Simple Linear Patterns

1. a 1 2 3 4 5 6
   6 12 18 24 30 36
   b $P = 6D$ c 66 d 13
2. a 1 2 3 4 5 6
   9 18 27 36 45 54 $P = 9T$
   b 1 2 3 4 5 6
   60 120 180 240 300 360 $S = 60M$
   c 1 2 3 4 5 6
   5 10 15 20 25 30 $V = 5P$
   d 1 2 3 4 5 6
   8 16 24 32 40 48 $L = 8T$
3. a 0 1 2 3 4 5 6
   0 3 6 9 12 15 18 $y = 3x$
   check linear diagram
   b 0 1 2 3 4 5 6
   0 2 4 6 8 10 12 $y = 2x$
   check linear diagram

Ch 4 Ex 3 Harder Linear Patterns

1. a 1 2 3 4 5 6
   3 4 5 6 7 8
   b $P = T + 2$ c 23 d 25
2. a 0 1 2 3 4 5
   3 5 7 9 11 13 $y = 2x + 3$
   b 0 1 2 3 4 5
   5 6 7 8 9 10 $y = x + 5$
   c 0 1 2 3 4 5
   -2 1 4 7 10 13 $y = 3x - 2$
   d 0 1 2 3 4 5
   -1 4 9 14 19 24 $y = 5x - 1$
   e -2 -1 0 1 2 3
   -6 -4 -2 0 2 4 $y = 2x - 2$
   f -2 -1 0 1 2 3
   -18 -11 -4 3 10 17 $y = 7x - 4$