Rounding off Whole Numbers 1

9b

1) Round off each of these numbers correct to the nearest 10.

a) 67 b) 81 c) 99 d) 118 e) 342

f) 452 g) 755 h) 945 i) 1329 j) 2236

2) Round off each of these numbers correct to the nearest 100.

a) 487 b) 556 c) 412 d) 943 e) 1234

f) 4531 g) 6483 h) 4060 i) 6050 j) 7561

3) The table shows the distances of some large cities from London.
The distances are measured in kilometres.

City	Distance in km	Distance in km to the nearest 10km	Distance in km to the nearest 100km
Rome	1452		
Paris	1036		
New York	5505		
Cairo	3512		
Vienna	1265		

a) Write down their distances rounded to the nearest 10km and the nearest 100km.
Put these values into the table.

b) There is another city which is not on the list.
Its distance from London is 1600km, to the nearest 100km, and a distance of 1610km to the nearest 10km.
Write down a possible distance of the city to the nearest kilometre.

Multiplication 1

Do not use a calculator

9b

1) Multiply each of the following.

a) 14 × 2

b) 13 × 3

c) 18 × 5

d) 23 × 6

e) 38 × 7

f) 41 × 5

g) 57 × 4

h) 82 × 7

i) 63 × 8

j) 71 × 9

k) 84 × 6

l) 93 × 8

m) 39 × 6

n) 49 × 5

o) 37 × 6

p) 35 × 4

q) 56 × 8

r) 64 × 9

2) Multiply each of the following.

a) 24 × 15

b) 46 × 12

c) 84 × 23

d) 47 × 34

e) 153 × 4

f) 237 × 5

g) 473 × 8

h) 532 × 9

i) 467 × 7

j) 321 × 40

k) 465 × 60

l) 538 × 70

m) 83 × 27

n) 94 × 45

o) 79 × 62

p) 532 × 34

q) 63 × 80

r) 406 × 84

Mixed Fractions 1

9b

In all of these questions give the answers as fractions in their lowest terms.

1) There are 45 cars in a car park.
25 of them are black.
a) What fraction of the cars are black?
b) What fraction of the cars are not black?

2) 60 pupils sit an examination.
36 pass and the remainder fail.
a) What fraction of the pupils pass?
b) What fraction of the pupils fail?

3) In a wood there are 120 trees.
65 of them are oak and the remainder are ash.
a) What fraction of the wood is oak?
b) What fraction of the wood is ash?

4) Sophie goes from school to the sports centre.
The distance is 1500 metres.
She runs the first 400 metres and walks the rest of the way.
a) What fraction of the journey does she run?
b) What fraction of the journey does she walk?

5) MISSISSIPPI
a) What fraction of this word is made up of S's?
b) What fraction of this word is made up of I's?
c) What fraction of this word is made up of P's?
d) What fraction of this word is made up of M's?

6) A bunch of flowers is made up of 15 red roses, 7 white roses and 13 yellow roses.
a) What fraction of the bunch are red roses?
b) What fraction of the bunch are white roses?
c) What fraction of the bunch are yellow roses?

Calculating a Fraction 2

9b

1) Use a calculator to work out each of these.

a) $\frac{2}{5}$ of 21 centimetres b) $\frac{1}{6}$ of 33 litres c) $\frac{5}{8}$ of 42 kilograms

d) $\frac{3}{5}$ of 24 metres e) $\frac{3}{8}$ of 36 metres f) $\frac{2}{7}$ of 45.5 litres

g) $\frac{3}{10}$ of 130cms h) $\frac{5}{12}$ of 40km i) $\frac{5}{8}$ of 28 metres

j) $\frac{7}{16}$ of 56 litres k) $\frac{5}{9}$ of 94.5kg l) $\frac{5}{12}$ of 111 litres

2) If $\frac{1}{5}$ of a number is 5, what is the number?

3) If $\frac{1}{8}$ of a number is 7, what is the number?

4) £1.80 is shared between two people.

Rachel gets $\frac{2}{3}$ of it and Nicole gets the rest.

How much do they each get?

5) $\frac{3}{8}$ of the people at a concert are male and the rest are female.

There are a total of 1232 people at the concert.

a) What fraction of the audience are female?

b) How many are female?

6) A factory produces 850 cars.

3 cars in every 10 are white, the remainder are red.

a) What fraction of the cars are white?

b) What fraction of the cars are red?

c) How many white cars are produced?

7) 260 people sit an examination.

$\frac{3}{20}$ of them gained the top grade.

How many did not get the top grade?

Ratio and Proportion 1

9b

1) Which of the following ratios are equivalent to 20 : 30?

a) 8 : 12
b) 16 : 20
c) 2 : 3
d) 6 : 4
e) 9 : 13
f) 40 : 50
g) 4 : 6
h) 40 : 60

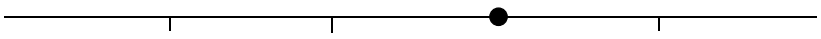
2) Which of the following ratios are equivalent to 24 : 40 : 60?

a) 18 : 30 : 45
b) 60 : 40 : 24
c) 6 : 10 : 15
d) 16 : 24 : 30
e) 48 : 80 : 120
f) 72 : 110 : 140
g) 12 : 20 : 30
h) 30 : 50 : 70

3) Split £84 up into the following ratios.

a) 2 : 1
b) 5 : 2
c) 7 : 5
d) 20 : 1
e) 16 : 5
f) 3 : 4 : 5
g) 6 : 7 : 8
h) 11 : 9 : 8

4) This length of rope has a knot tied in it. It divides it into the ratio 3 : 2



It also divides it into the proportions $\frac{3}{5}$ and $\frac{2}{5}$ or 60% and 40%.

Write down these ratios as proportions.

a) 2 : 1
b) 5 : 3
c) 7 : 3
d) 6 : 5
e) 4 : 5
f) 2 : 3 : 4
g) 3 : 7 : 10
h) 6 : 7 : 8
i) 2 : 7 : 12
j) 7 : 11 : 15

Inverse Operations 1

Do not use a calculator

9b

1) Anna likes to check her work by doing inverse operations.
This is what she does.
When she has done a subtraction like this:-

67 – 24 = 43

she does an inverse operation on it, like this:-

43 + 24 = 67

Check these subtractions by doing an inverse operation on them.
Which are wrong?

a) 27 – 13 = 14	b) 37 – 19 = 19	c) 45 – 30 = 15
d) 56 – 35 = 21	e) 74 – 66 = 18	f) 89 – 34 = 56
g) 91 – 35 = 56	h) 84 – 39 = 45	i) 66 – 29 = 35
j) 121 – 99 = 22	k) 143 – 87 = 56	l) 163 – 112 = 51
m) 145 – 107 = 38	n) 231 – 66 = 65	o) 274 – 135 = 139
p) 326 – 125 = 201	q) 321 – 284 = 37	r) 432 – 345 = 187

2) When Anna checks a divide like this:-

561 ÷ 17 = 33

she does a multiplication like this:-

33 × 17 = 561

Check these divisions by doing the inverse operation on them.
Which are wrong?

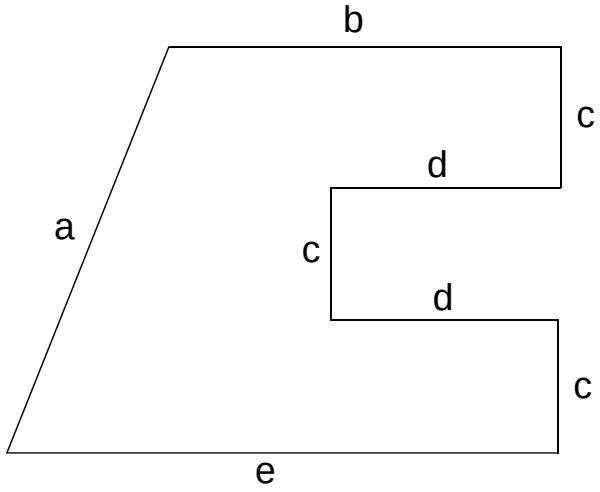
a) 120 ÷ 15 = 8	b) 204 ÷ 17 = 12	c) 336 ÷ 16 = 23
d) 432 ÷ 18 = 25	e) 323 ÷ 17 = 19	f) 544 ÷ 34 = 16
g) 567 ÷ 21 = 37	h) 775 ÷ 31 = 35	i) 648 ÷ 36 = 18
j) 896 ÷ 32 = 28	k) 1353 ÷ 33 = 41	l) 1665 ÷ 45 = 27
m) 2016 ÷ 48 = 42	n) 901 ÷ 17 = 52	o) 1728 ÷ 64 = 27
p) 2584 ÷ 76 = 34	q) 3484 ÷ 52 = 67	r) 3621 ÷ 71 = 51

Adding Letters 2

9b

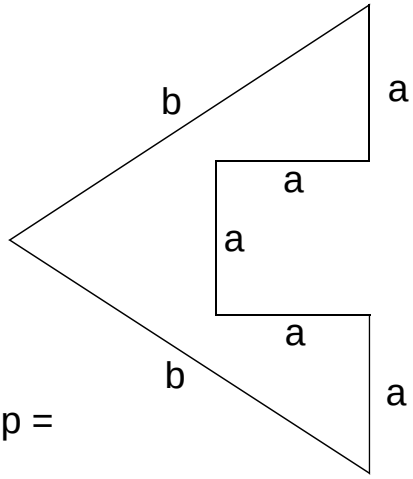
The perimeter of this shape is

$p = a + b + 3c + 2d + e$



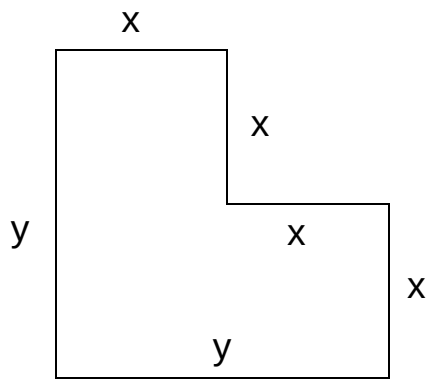
Write down expressions for the perimeters of these shapes.
In each case write down the expression in its simplest form.

a)



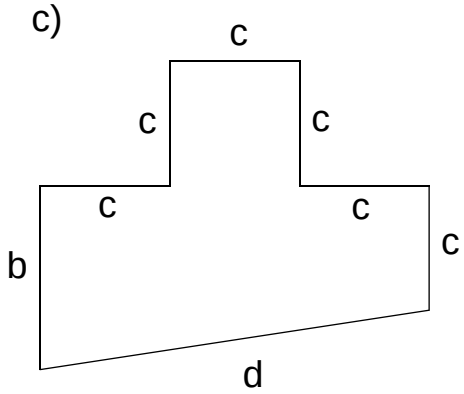
p =

b)



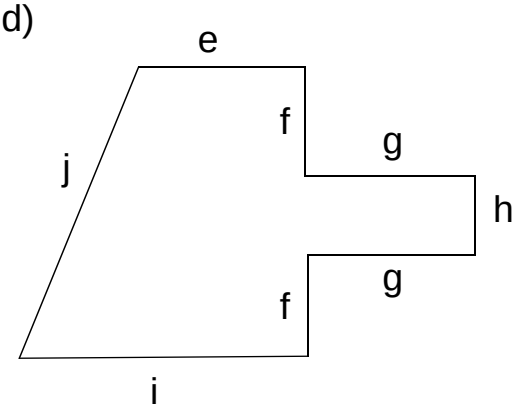
p =

c)



p =

d)

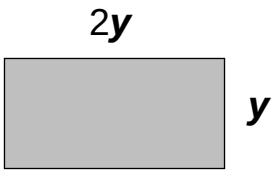


p =

Perimeters of Tiles 2

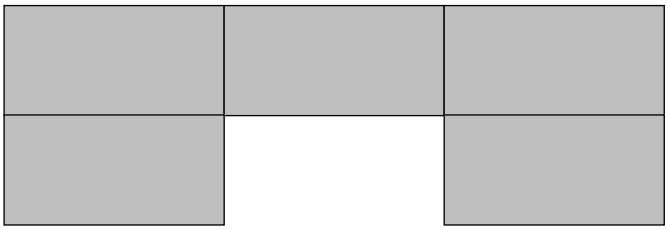
9b

This is a rectangular tile.
Its length is twice as long as its width.



The perimeter of this tile is $p = 6y$

1) A number of these tiles are put together like this.

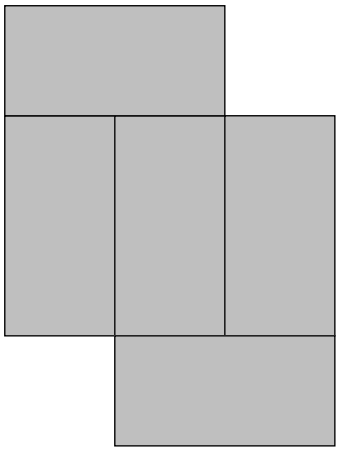


a) Write down an equation for the perimeter of this shape:-

$p =$

b) The perimeter of this shape is 108 centimetres.
What are the dimensions of the tile?

2) The tiles are re-arranged like this.



a) Write down the perimeter (***p***) of the shape using ***y***:-

$p =$

b) What is the perimeter of the shape in centimetres?

Brackets 2

9b

1) Write down each of the following expressions in their simplest form.

a) (4x + 5) + (3x + 4)
b) (3y + 6) + (4y – 2)
c) (a + 4) + (3a – 2)
d) (4n – 3) + (6n + 7)
e) (5c + 4) + (3c + 8)
f) (3x – 5) + (4x – 6)
g) (5b – 4a) + (7b – 3a)
h) (4y – 7x) + (5y + 3x)
i) (x – 5y) + (4x + 6y)
j) (5n + 7m) + (5n – 3m)

2) Change these expressions into their simplest form without the brackets.

a) 3 – (– 2)
b) 4 – (– 2)
c) 6 – (– 4)
d) 6 – (– 2)
e) 4x – (– 3x)
f) 3y – (– 5y)
g) 5a – (– 3a)
h) 6b – (– 4b)
i) 5a – (– 5)
j) 5 – (– 7b)
k) 6 – (– 4b)
l) 5 – (– 6y)

3) Simplify these as much as you can.

a) (4 + 3) – (2 + 5)
b) (6 + 3) – (3 – 5)
c) (3 + 5) – (2 – 7)
d) (4 + 3) – (5 – 4)
e) (6 + 5) – (4 – 6)
f) (4 + 5) – (7 + 9)
g) (–4 – 6) – (5 – 4)
h) (6 + 5) – (–4 – 6)
i) (7 – 6) – (–7 – 3)
j) (4 + 6) – (–4 + 8)

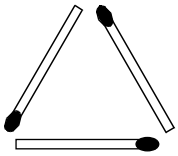
4) Simplify these as much as you can.

a) (3x + 4) – (5x + 3)
b) (6a + 7) – (4a + 1)
c) (3b + 6) – (b + 8)
d) (3y + 4) – (2y + 6)
e) (7n + 5) – (6n – 5)
f) (6a + 7) – (6a – 3)
g) (7n + 4) – (n – 3)
h) (6x + 5) – (x + 8)
i) (3x + 3) – (5x – 4)
j) (5 + 3n) – (3 – 5n)
k) (7 + 5y) – (6 – 6y)
l) (7 + 4x) – (3 – x)

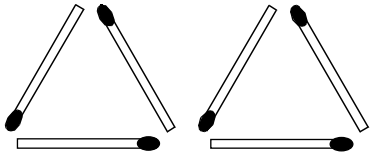
Number Patterns 1

9b

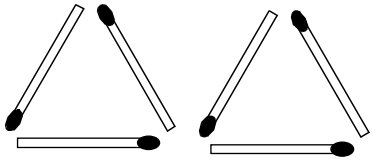
The diagram shows triangles made from matchsticks.

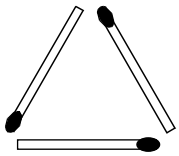


1 Triangle
3 Matchsticks



2 Triangles
6 Matchsticks





3 Triangles
9 Matchsticks

a) How many matchsticks are needed to make 7 triangles?

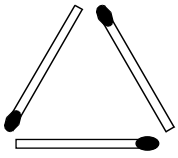
b) Write in words how you calculate the number of matchsticks you need if you know the number of triangles.

c) t means the number of triangles. m means the number of matchsticks. Which of these is the rule for calculating the number of matchsticks needed?

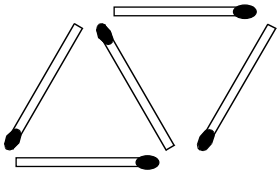
m = 2t + 1 m = t + 3 m = 3t + 1 m = 3t

d) Use the rule to calculate the number of matchsticks needed to make 15 triangles.

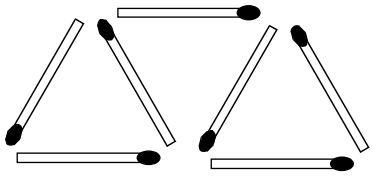
Here are some more triangles.



1 Triangle
3 Matchsticks



2 Triangles
5 Matchsticks



3 Triangles
7 Matchsticks

e) How many matchsticks are needed to make 7 triangles?

f) Write in words how you calculate the number of matchsticks you need if you know the number of triangles.

g) Which of these is the rule for calculating the number of matchsticks?

m = 3t + 1 m = 2t + 1 m = 3t m = t + 3

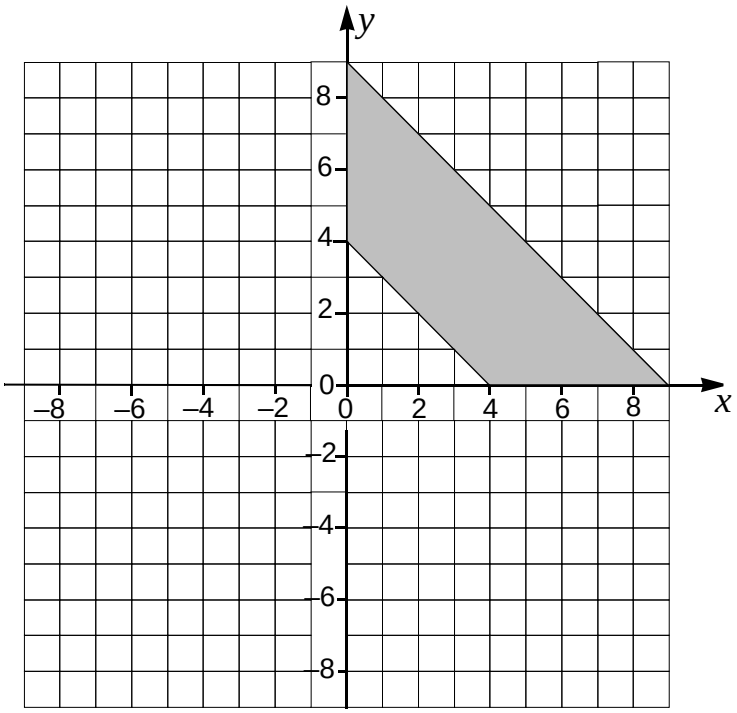
Negative Co-ordinates 2

9b

1) a) What is the name given to the shape in the diagram below?

b) Draw the diagram on squared paper.

c) Draw a reflection of the shape about the x axis.



d) Describe the shape with vertices (0,4), (4,0) and (0,–4).

e) Draw a reflection of the two shapes you now have about the y axis.

f) The complete shape is made from two squares. Write down the co-ordinates of their vertices.

2) Three corners of a rectangle have co-ordinates of A(6,–1), B(0,5) and C (–4,1). The diagonal is AC.

a) Plot these points.

b) What are the co-ordinates of the fourth corner? Plot this point.

c) What are the co-ordinates of the centre of this rectangle?

d) A similar rectangle is drawn inside the first rectangle.
One of its shorter sides has co-ordinates of (-1,0) and (1,2).
What are the co-ordinates of the other two corners of the rectangle?

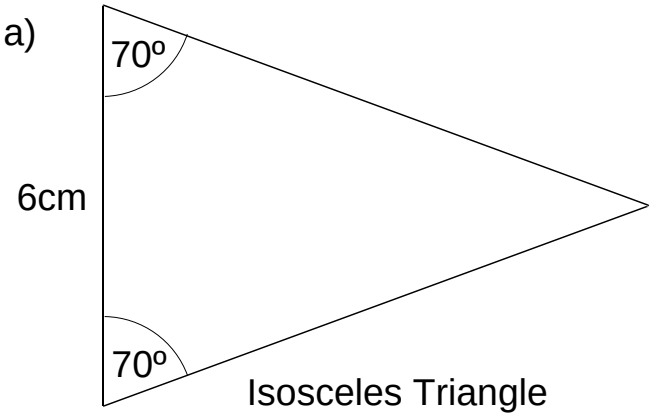
e) How many times bigger than the second rectangle is the first?

Drawings 2

9b

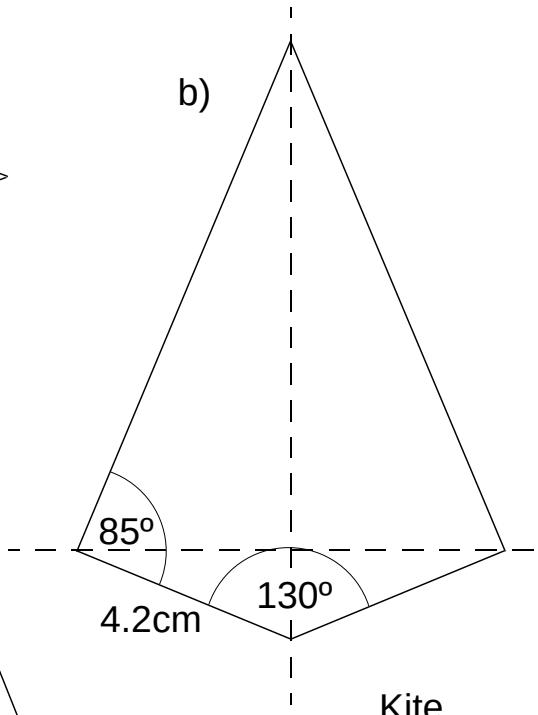
Draw the following shapes full size.

a)



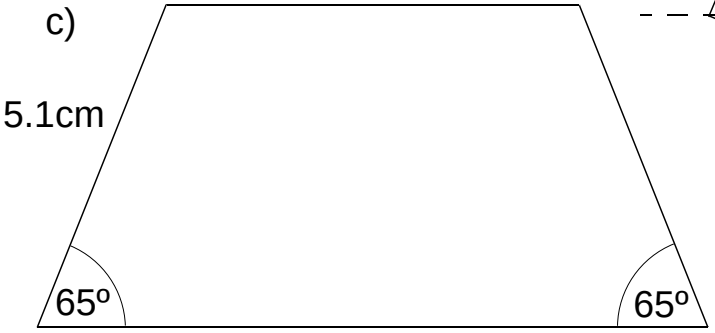
Isosceles Triangle

b)



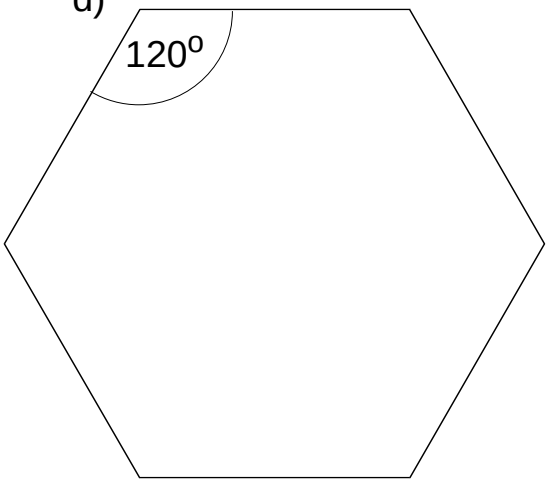
Kite

c)



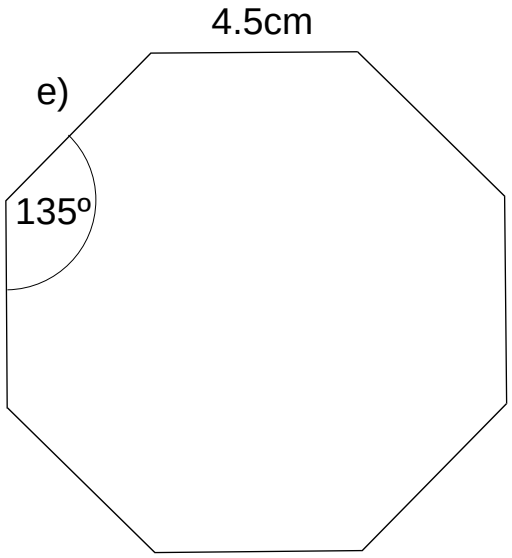
Trapezium

d)



Regular Hexagon

e)



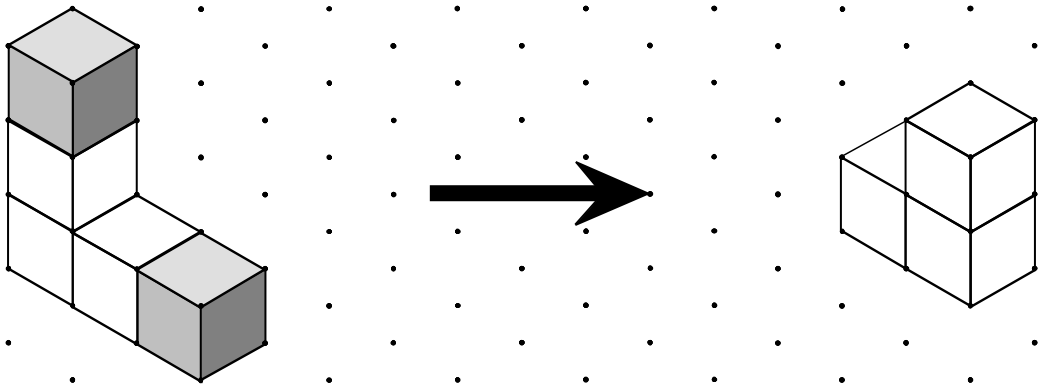
Regular Octagon

Missing Blocks 1

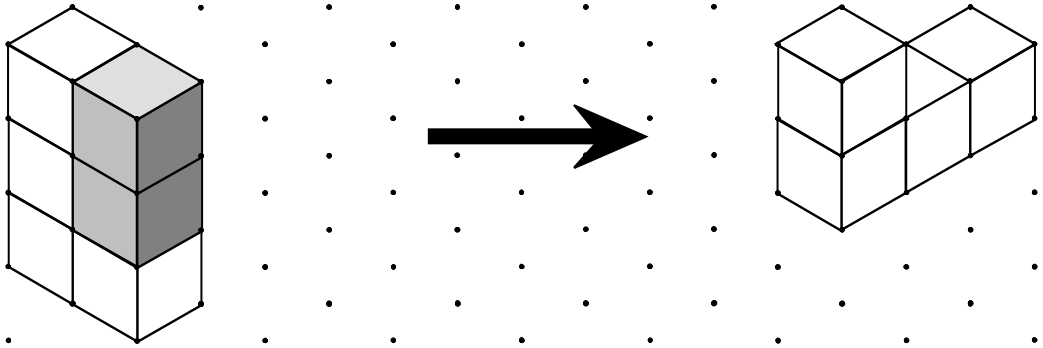
9b

In each of the pair of diagrams below, both shapes are the same but viewed from different directions.
The right hand view has two dark blocks missing.
Put in the missing dark blocks.

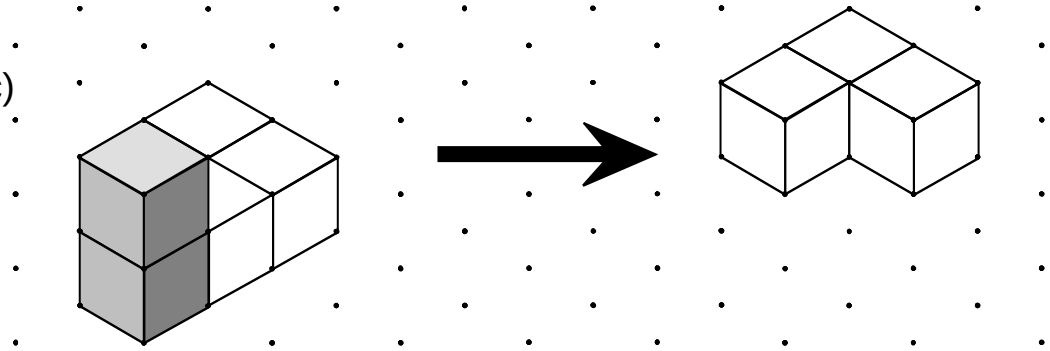
a)



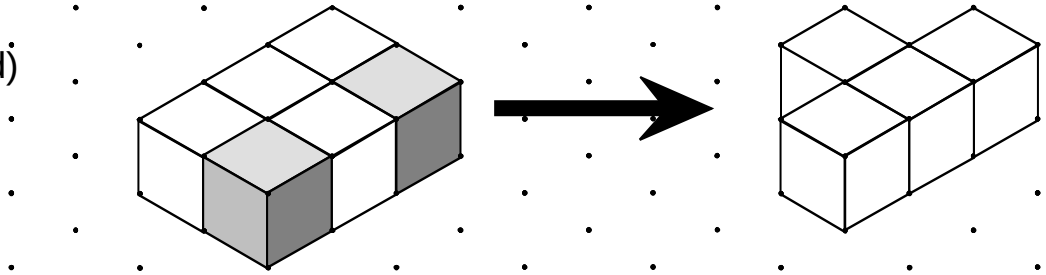
b)



c)



d)



Area and Perimeter 2

Do not use a calculator

9b

1) A garden lawn is in the shape of a rectangle.
It measures 7 metres by 14 metres.
What is its area in square metres?

2) Jacob has a sheet of A4 paper.
It measures 210mm by 297mm.
He draws 2cm squares on it and cuts them out.
a) What is the maximum number of squares he can cut out?
Altogether he wants 500 squares of paper.
b) How many sheets of A4 paper will he need?

3) A garden has a long fence on 3 of its sides.
Two lengths of fence are 15 metres long and the third is 10 metres.
The height of the fence is 2 metres.
a) What is the total area of the fence?
b) If it is to be painted on both sides, what area needs to be covered?
1 litre of paint is enough to cover 20 square metres.
c) How much paint will be required?

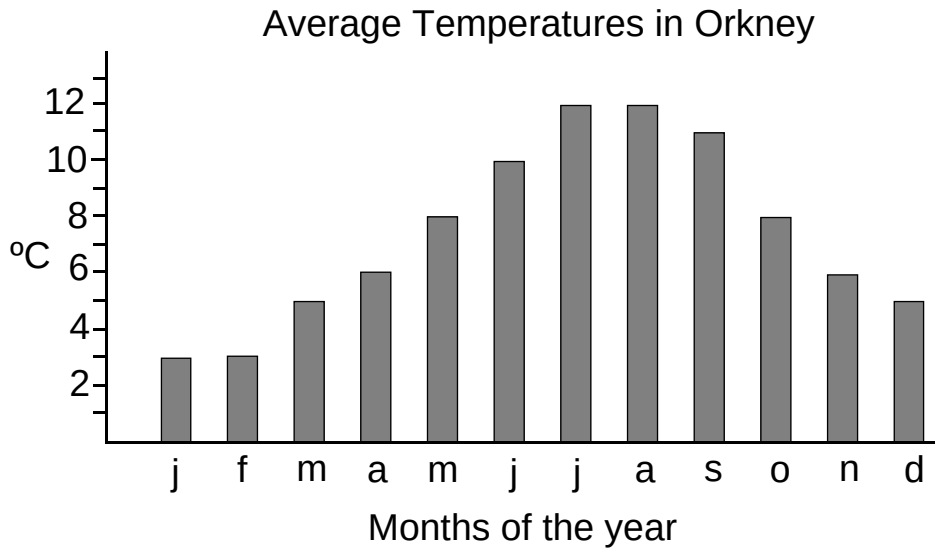
4) The floor of a room is in the shape of a rectangle, measuring 3.3 metres by 4.1 metres.
a) What is the area of the floor in square metres?
Bill covers the floor with 2 coats of varnish.
1 litre of varnish is enough to cover 10 square metres once.
b) How much varnish does he need?
Varnish can be bought in 500ml, 1 litre and 2.5 litre tins.
c) Which two tins should he buy to have the least amount of varnish left over?

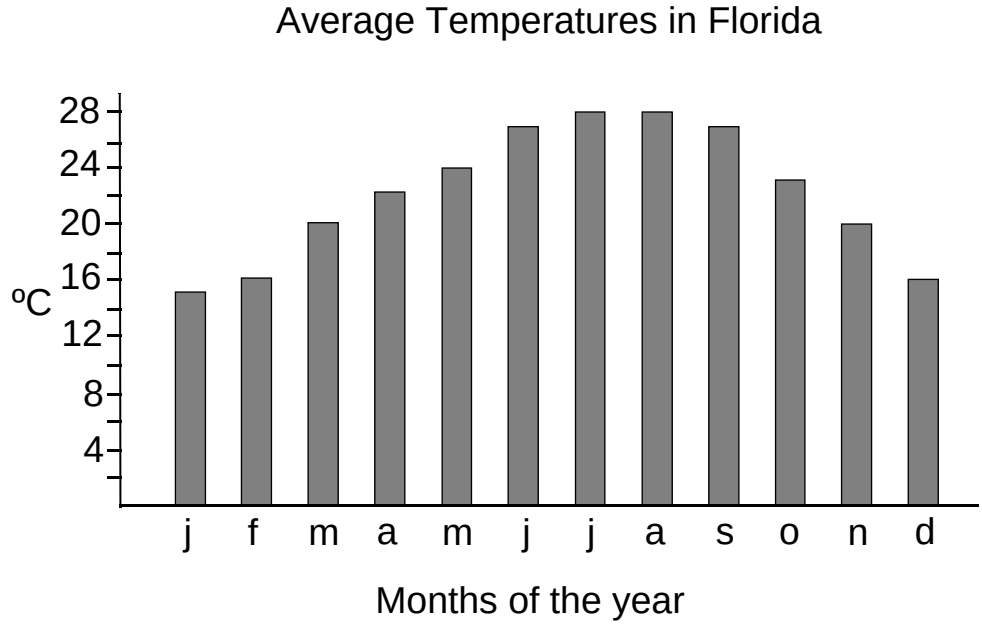
5) A ream of A4 paper contains 500 sheets.
Each sheet of paper measures 210 by 297mm.
a) What is are the dimensions of a sheet of paper in centimetres?
b) What is the area of one sheet of paper in square centimetres?
c) What is the total area of 500 sheets of paper, in square centimetres?
d) What is the total area of these sheets in square metres?
One square metre of the paper weighs 80 grams.
e) What is the weight of one ream of paper?

Average Temperatures

9b

The bar charts below show the average monthly temperatures in the Orkney Islands and Florida.





a) Which is colder, the Orkney Islands or Florida?

b) Which months are hottest in both places?

c) What is the range of the annual temperatures for each place?

d) Which are the two coldest months in Orkney?

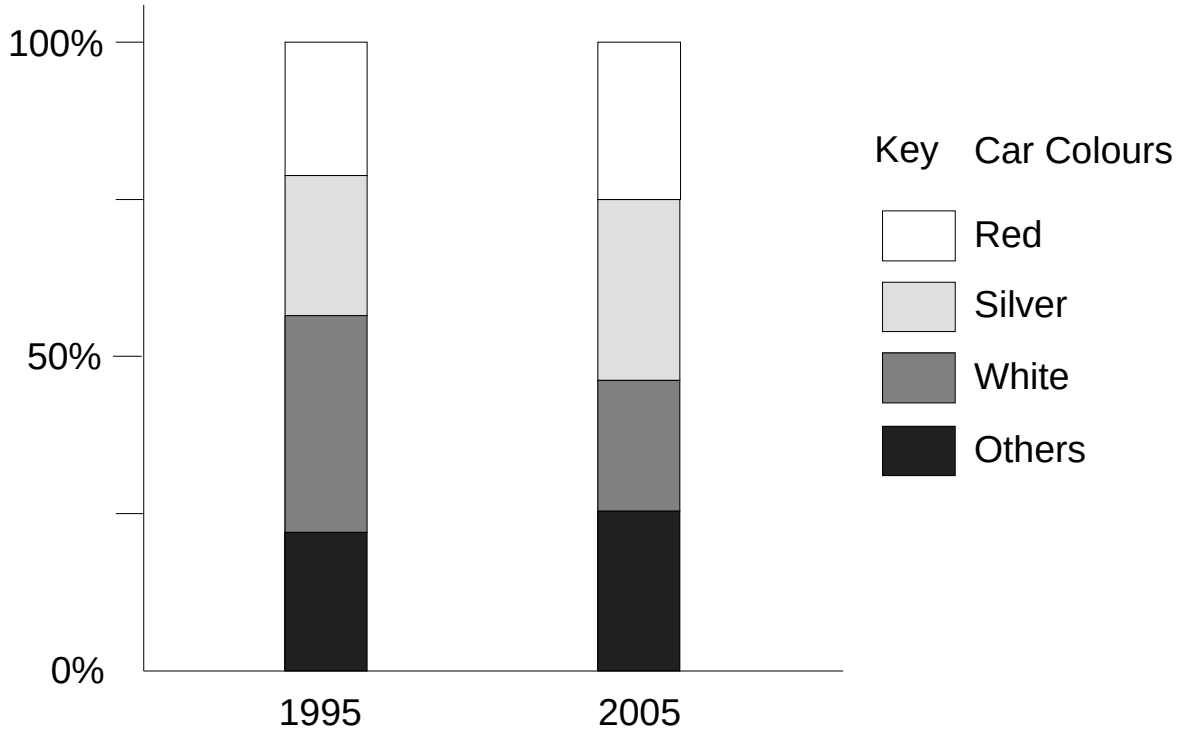
e) Where and when is the average monthly temperature 23ºC?

f) Where and when is the average monthly temperature 11ºC?

Percentage Bars 1

9b

The diagram shows the colours of cars sold by a dealer.
One bar shows those sold in 1995 and the other in 2005.



a) Which colour was the most popular in 1995?
b) Which colour was the most popular in 2005?
c) Which colour sold less in 2005 than in 1995?
d) What was the approximate share of red cars in 1995?
e) What was the approximate share of silver cars in 2005?
f) What was the approximate increase share of silver cars in 2005 compared with 1995?
g) Approximately by what percentage did the white share go down between 1995 and 2005?
h) The total number of cars sold in 1995 was 2,500. Approximately how many were white?
i) The total number of cars sold in 2005 was 3,200. Approximately how many were white?

Chances 2

9b

1) A box contains 12 balls.
7 are black, 3 are white and 2 are blue.
Jamie puts his hand into the box and takes out a ball.
Each ball has an equal chance of being chosen.
a) What is the probability of taking a black ball?
b) What is the probability of taking a white ball?
c) What is the probability of taking a blue ball?
d) Which colour has the greatest probability of being chosen?
e) Which colour has the least probability of being chosen?
f) What is the probability of taking a white or blue ball?

2) Phoebe does a survey.
She records the types of trees she passes on her way to school.
Half way to school she stops to look at her results.
These are her results.

Type of Tree	Number
Ash	5
Sycamore	14
Oak	7
Hawthorn	11
Willow	3
Birch	6

Use these results to answer these questions.
a) Which tree is the most common?
b) Which of these trees is the least common?
c) Which tree is she most likely to pass next? Explain your answer.
d) Which of these trees is she least likely to past next? Explain your answer.