Foundation Exam Question Practice

Unit 1 – NUMBER

2 How many minutes are there in $3\frac{1}{4}$ hours?

..... minutes

(Total for Question 2 is 1 mark)

3 Write 4.4354 correct to 2 decimal places.

.....

(Total for Question 3 is 1 mark)

2 Write the following numbers in order of size.
Start with the smallest number.

–3 4 0 –1 2

.....

(Total for Question 2 is 1 mark)

3 Write down two factors of 15

.....

(Total for Question 3 is 1 mark)

6 Dave goes into a cafe and buys 2 cups of coffee and a piece of cake.

Each cup of coffee costs £2.75
The cake costs £2.90

Dave pays with a £10 note.

He thinks he will get more than £1.50 in change.

Is Dave correct?
You must show how you get your answer.

(Total for Question 6 is 3 marks)

8 Joanne wants to buy a dishwasher.

The dishwasher costs £372

Joanne will pay a deposit of £36
She will then pay the rest of the cost in 4 equal monthly payments.

How much is each monthly payment?

£.....

(Total for Question 8 is 2 marks)

12 Find the value of $\dfrac{\sqrt{13.4 - 1.5}}{(6.8 + 0.06)^2}$

Write down all the figures on your calculator display.

.....

(Total for Question 12 is 2 marks)

Unit 2 – ALGEBRA

1 (a) Simplify $5p - 3p + p$

.....

(1)

(b) Simplify $m^3 + m^3$

.....

(1)

(c) Simplify $10 + 3c + 5d - 7c + d$

.....

(2)

(Total for Question 1 is 4 marks)

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7 There are y boats on a lake.
There are 7 people in each boat.

Write an expression, in terms of y, for the total number of people in the boats.

.....

(Total for Question 7 is 1 mark)

---

10 Barney has x crayons.

Eli has five **more** crayons than Barney.

Raj has **twice** as many crayons as Barney.

Write an **expression** in terms of x for the total number of crayons Barney, Eli and Raj have.

Give your answer in **its simplest form.**

_____

(3 marks)

8 (a) Simplify $a \times b \times 7$

.....

(1)

(b) Simplify $y \times y \times y$

.....

(1)

(c) Simplify fully $\dfrac{e \times e \times e \times f}{e \times e \times f \times f}$

.....

(2)

(Total for Question 8 is 4 marks)

---

11 $P = 7r + 3q$

Work out the value of P when $r = 5$ and $q = -4$

.....

(Total for Question 11 is 2 marks)

---

14 (a) Factorise $5 - 10m$

.....

(1)

(b) Factorise fully $2a^2b + 6ab^2$

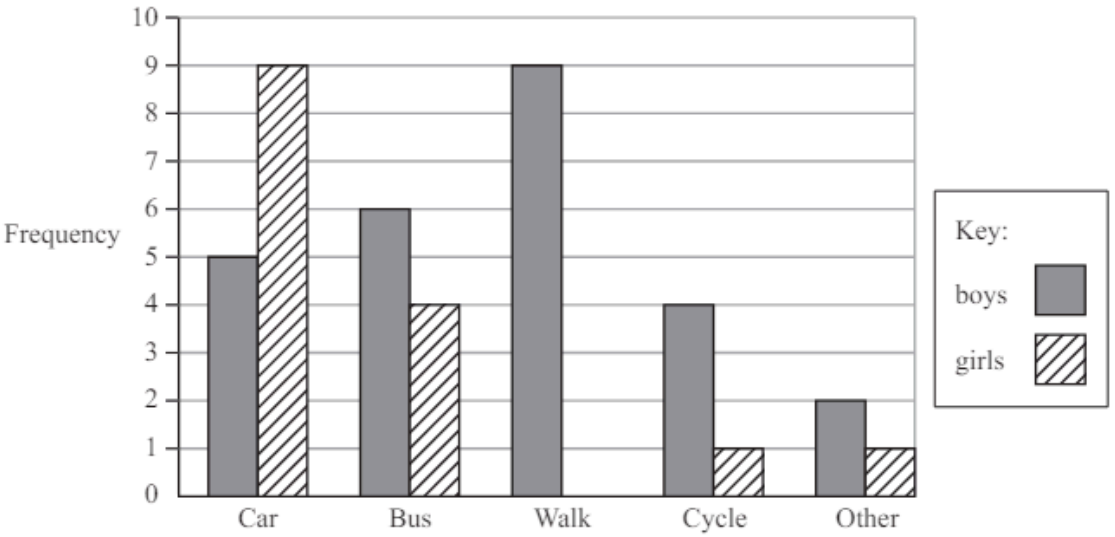
.....

(2)

(Total for Question 14 is 3 marks)

Unit 3 – GRAPHS, TABLES and CHARTS

3 A teacher asks the students in Year 6 what type of transport they use to get to school. The dual bar chart shows some of the results.



(a) What is the most popular type of transport used by the boys?

(1)

7 girls walk to school.

(b) Show this information on the dual bar chart.

(1)

More of the students get to school by car than by bus.

(c) How many more?

.....

(1)

The number of students in Year 5 is the same as the number of students in Year 6

(d) What is the total number of students in Years 5 and 6?

.....

(2)

(Total for Question 3 is 5 marks)

6 Here is a list of numbers.

12 15 14 17 22 19 13

Bridgit says,

"To work out the median you find the middle number, so the median of these numbers is 17"

Bridgit's answer is **not** correct.

(a) What is wrong with Bridgit's method?

.....

.....

(1)

(b) Work out the range of the numbers in the list.

.....

(2)

(c) Work out the mean of the numbers in the list.

.....

(2)

(Total for Question 6 is 5 marks)

---

9 Complete the two-way table.

	Tea	**Coffee**	**Squash**	**Total**
Boys	17		23	53
Girls		8		
Total			45	100

(3 marks)

Unit 4 – FRACTIONS AND PERCENTAGES

4 $\frac{4}{5}$ of a number is 32

Find the number.

.....

(Total for Question 4 is 2 marks)

---

4 Here are four fractions.

$$\frac{2}{5} \qquad \frac{11}{30} \qquad \frac{1}{2} \qquad \frac{7}{15}$$

Write these fractions in order of size.
Start with the smallest fraction.

.....

(Total for Question 4 is 2 marks)

5 A path is made of white tiles and grey tiles.

$\frac{1}{4}$ of the tiles are white.

(a) Write down the ratio of white tiles to grey tiles.

.....

(1)

There is a total of 56 tiles.

(b) Work out the number of grey tiles.

.....

(2)

(Total for Question 5 is 3 marks)

---

10 ABC is a straight line.

The length AB is five times the length BC.
$AC = 90$ cm.

Work out the length AB.

.....cm

(Total for Question 10 is 3 marks)

18 Daniel bakes 420 cakes.
He bakes only vanilla cakes, banana cakes, lemon cakes and chocolate cakes.

$\frac{2}{7}$ of the cakes are vanilla cakes.

35% of the cakes are banana cakes.

The ratio of the number of lemon cakes to the number of chocolate cakes is 4 : 5

Work out the number of lemon cakes Daniel bakes.

(Total for Question 18 is 5 marks)

Unit 5 – EQUATIONS, INEQUALITIES AND SEQUENCES

1 **a** Solve $5x = 30$

(1 mark)

b Solve $y - 7 = 15$

(1 mark)

2 **a** Solve $\frac{x}{3} = 6$

_____

(1 mark)

b Solve $4y + 3 = 27$

_____

(2 marks)

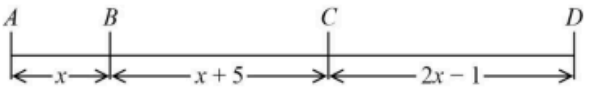
4 In the diagram,

$AB = x$ cm

$BC = (x + 5)$ cm

$CD = (2x - 1)$ cm

$AD = 28$ cm



a **Show that** $4x + 4 = 28$

(2 marks)

b **Solve** $4x + 4 = 28$

_____

(2 marks)

c Work out the **length** of BD.

_____

(2 marks)

10 Here are three symbols.

<	>	=

Write one of these symbols in each box to make four true statements.

14 ☐ 21

4 + 7 ☐ 103 − 92

2^2 ☐ 2 × 2

−3 ☐ −5

(Total for Question 10 is 2 marks)

25 Here are the first six terms of an arithmetic sequence.

3 8 13 18 23 28

(a) Find an expression, in terms of n, for the nth term of this sequence.

(2)

The nth term of a different sequence is $3n^2$
Nathan says that the 4th term of this sequence is 144

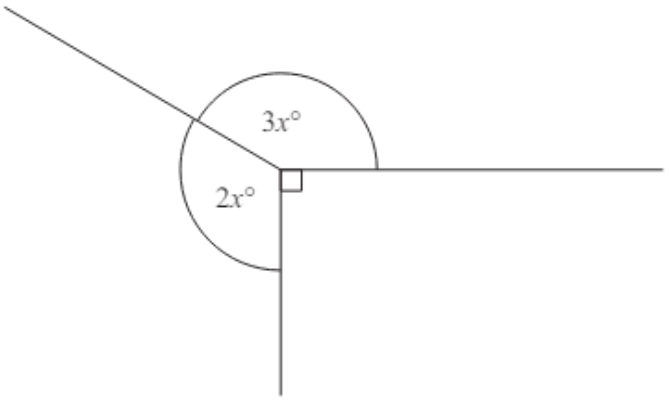
(b) Is Nathan right?
Show how you get your answer.

(1)

(Total for Question 25 is 3 marks)

Unit 6 – ANGLES

9



Find the value of x.

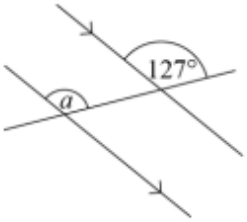
a The exterior angle of a regular polygon is 36°.
How many sides does the polygon have?

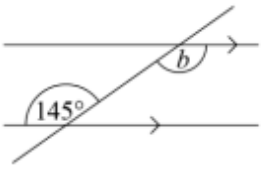
(1 mark)

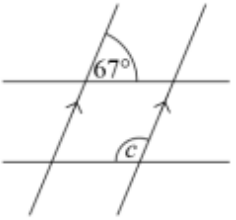
b A regular polygon has 9 sides.
Work out the sizes of the exterior and interior angles.

(2 marks)

Work out the sizes of the angles marked with letters.



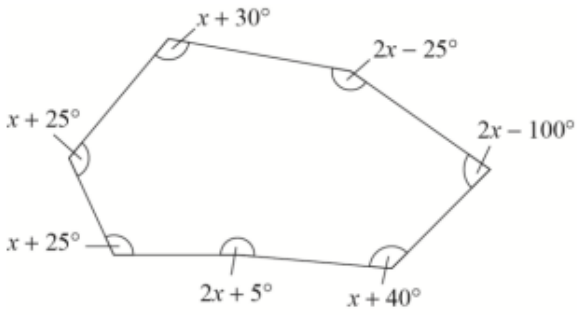




a = _____ b = _____ c = _____

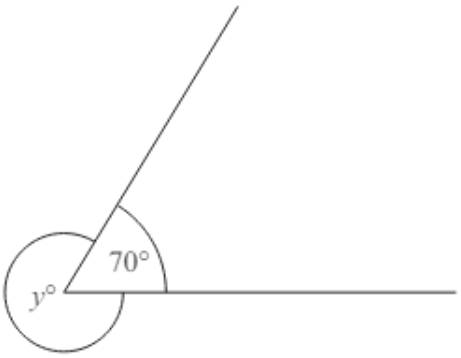
(3 marks)

The diagram shows a heptagon.



Work out the value of x.

(2 marks)



(a) Find the value of y.

$y =$ .....

(1)

(b) Give a reason for your answer.

.....

.....

.....

(1)

Unit 7 – AVERAGES AND RANGE

James surveys 20 people at a railway station about a how much they use public transport.
Explain why his sample is likely to be biased.

(2 marks)

3 The mean of 5 numbers is 11.

The mean of a different set of 7 numbers is 14.

What is the mean of all 12 numbers?

5 This stem-and-leaf diagram shows the masses of cats attending a vet's surgery one day.

1	8 8 9 9 9
2	0 1 4 5 7 9 9
3	2 3 3 3 7 8
4	0 0 1

Key:
1 | 8 means 1.8 kg

a Find the median mass.

(2 marks)

b Work out the range.

(1 mark)

9 Here is a list of numbers.

6 4 8 9 4 3

(a) Work out the median.

.....

(2)

25 The table gives information about the times taken, in seconds, by 18 students to run a race.

Time (t seconds)	Frequency
$5 < t \leqslant 10$	1
$10 < t \leqslant 15$	2
$15 < t \leqslant 20$	7
$20 < t \leqslant 25$	8

Work out an estimate for the mean time.
Give your answer correct to 3 significant figures.

..... seconds

(Total for Question 25 is 3 marks)

8 The mean age of the first 10 patients to arrive at a doctor's surgery is a.

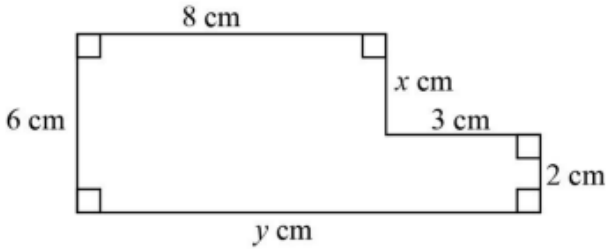
The mean age of the next 20 is b.

Write an **expression**, in terms of a and b, for the mean age of all 30 patients.

(2 marks)

Unit 8 – PERIMETER, AREA and VOLUME

3 Work out the value of x and the value of y.



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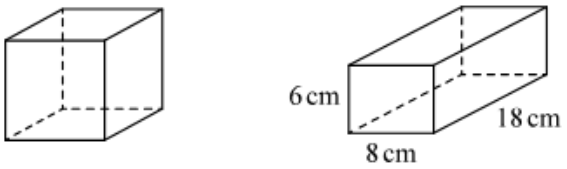
(2 marks)

29 The diagram shows a cube and a cuboid.



The total surface area of the cube is equal to the total surface area of the cuboid.

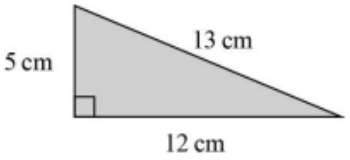
Janet says,

"The volume of the cube is equal to the volume of the cuboid."

Is Janet correct?
You must show how you get your answer.

(Total for Question 29 is 5 marks)

17 a Work out the **area** of this triangle.



_____

(2 marks)

14 Here is a rectangle.

Coby has to find the perimeter of this rectangle.

He writes,

Perimeter = 7×3

(a) What mistake has Coby made?

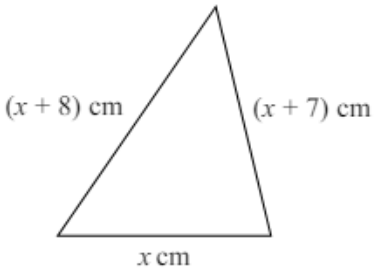
.....

.....

.....

(1)

Here is a triangle.



Iram solves a problem about this triangle to find the value of x.

Her answer is

$$x = -2$$

(b) Explain why Iram's answer must be wrong.

.....

.....

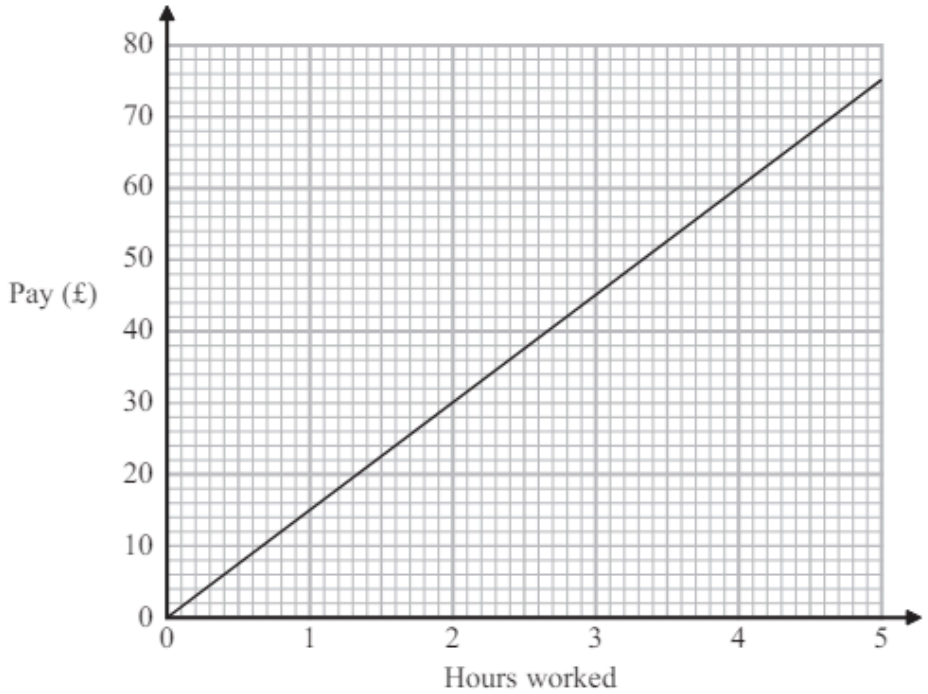
.....

(1)

(Total for Question 14 is 2 marks)

Unit 9 – GRAPHS

Nazima uses this graph to find out how much money she is paid for the number of hours she has worked.



(a) How much money is Nazima paid for each hour she works?

£.....

(1)

Last week Nazima worked for 36 hours.

(b) How much money was Nazima paid?

£.....

(2)

16 L is a straight line.

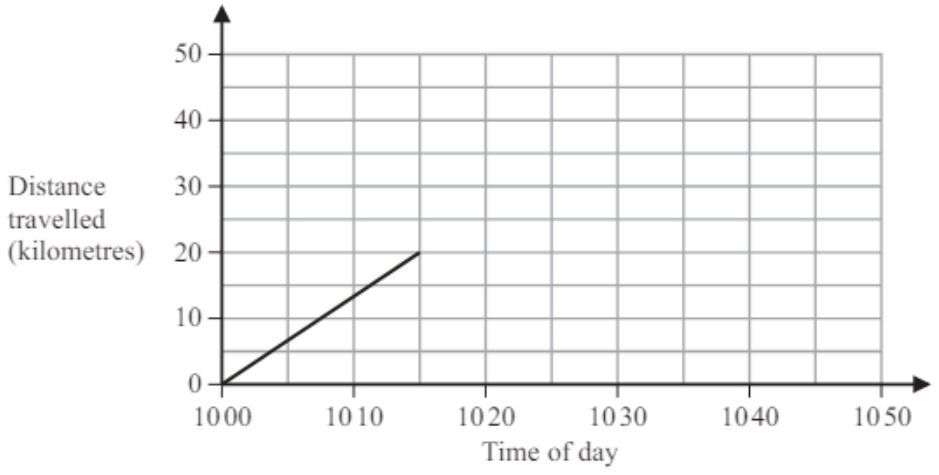
The gradient of line L is 3

Line L passes through the point (0, 1).

a Write down an equation of the straight line L.

(2 marks)

23 Sam drives his car on a journey.
Here is the travel graph for the first 15 minutes of his journey.



(a) Work out Sam's speed, in km/h, for the first 15 minutes of his journey.

..... km/h

(2)

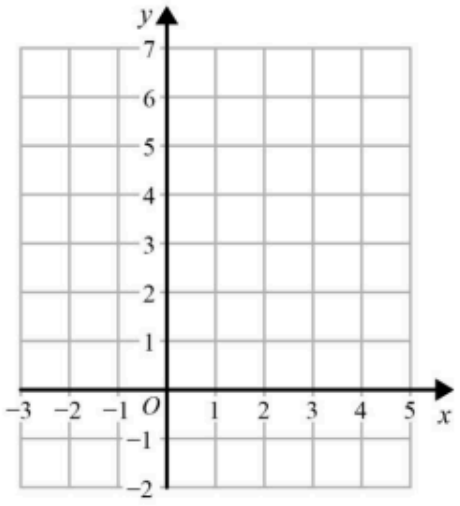
At 10 15 Sam stops for 10 minutes and then drives for 20 minutes at a speed of 75 km/h.

(b) On the grid, complete the travel graph for Sam's journey.

(3)

(Total for Question 23 is 5 marks)

11 On the grid, draw the graph of $y = \frac{1}{2}x + 1$ for values of x from -2 to 4.



(3 marks)

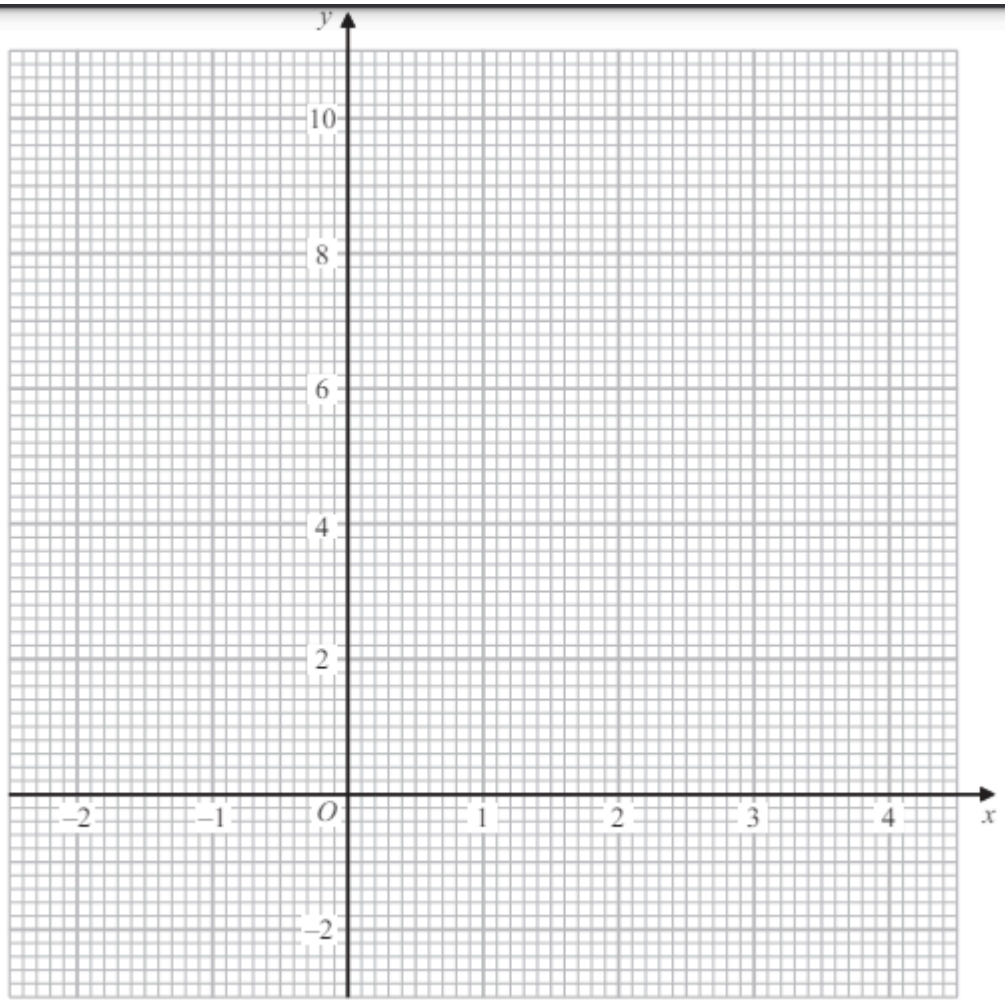
24 (a) Complete the table of values for $y = x^2 - 2x + 2$

x	–2	–1	0	1	2	3	4
y	10		2			5	

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x + 2$ for values of x from –2 to 4

(2)

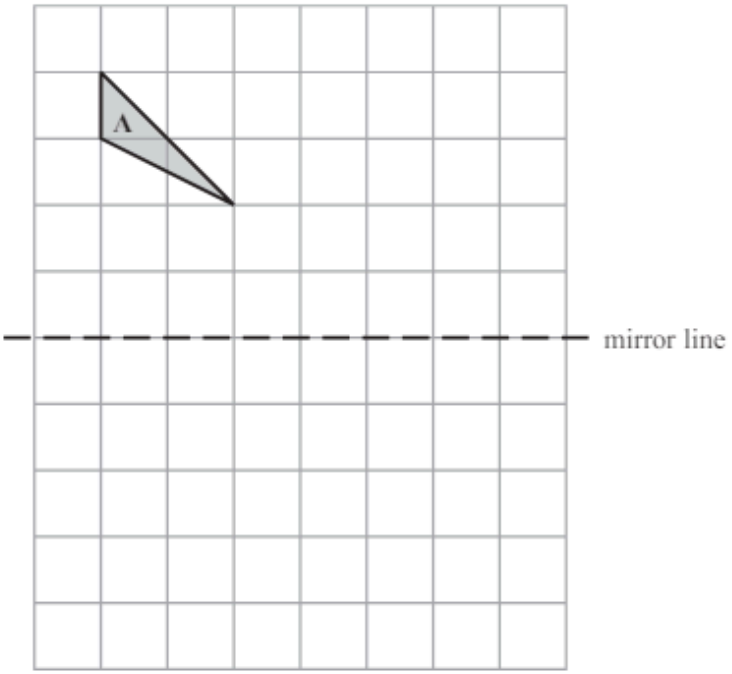


(c) Use your graph to find estimates of the solutions of the equation $x^2 - 2x + 2 = 4$

(2)

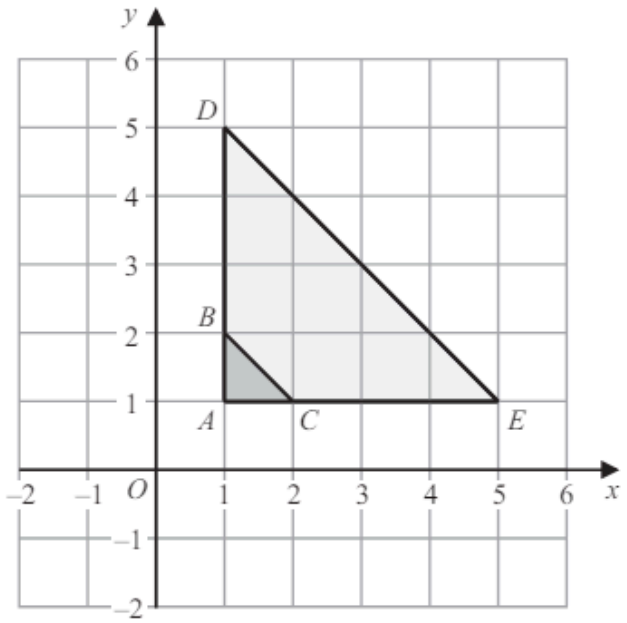
Unit 10 – TRANSFORMATIONS

11 Reflect shape **A** in the mirror line.



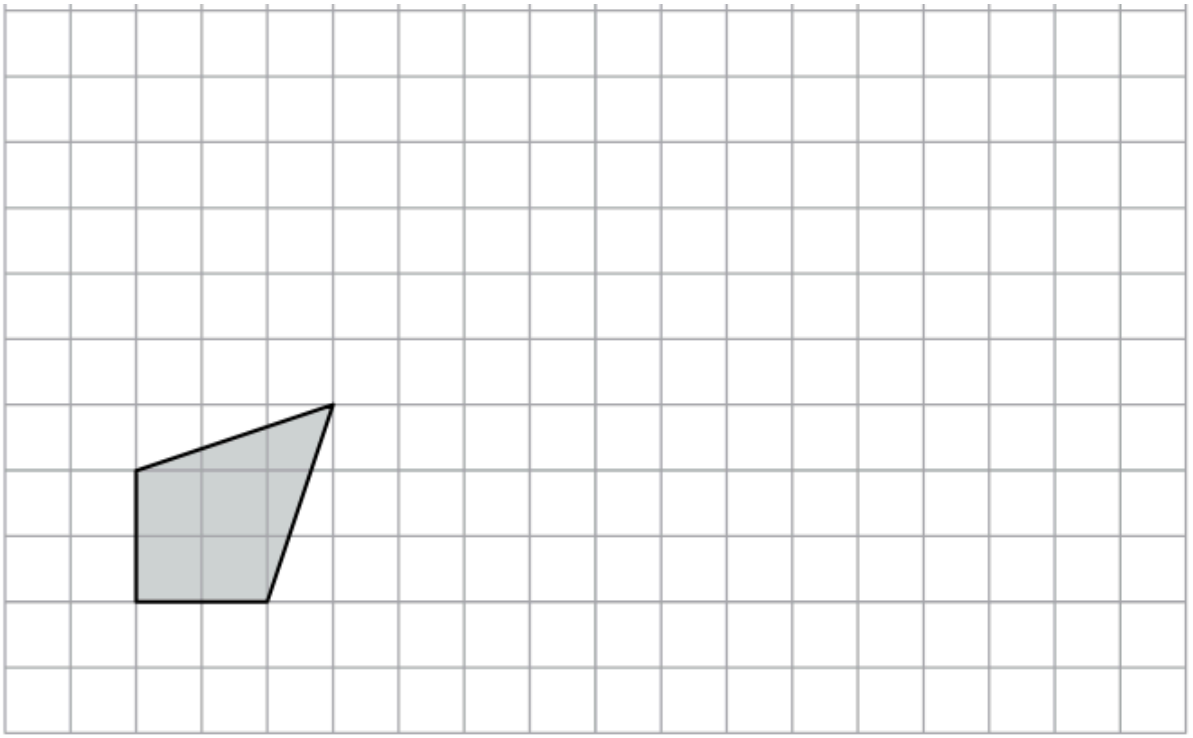
(Total for Question 11 is 2 marks)

16 Here is a diagram showing triangle *ABC* and triangle *ADE*.



Describe fully the single transformation that maps triangle *ABC* onto triangle *ADE*.

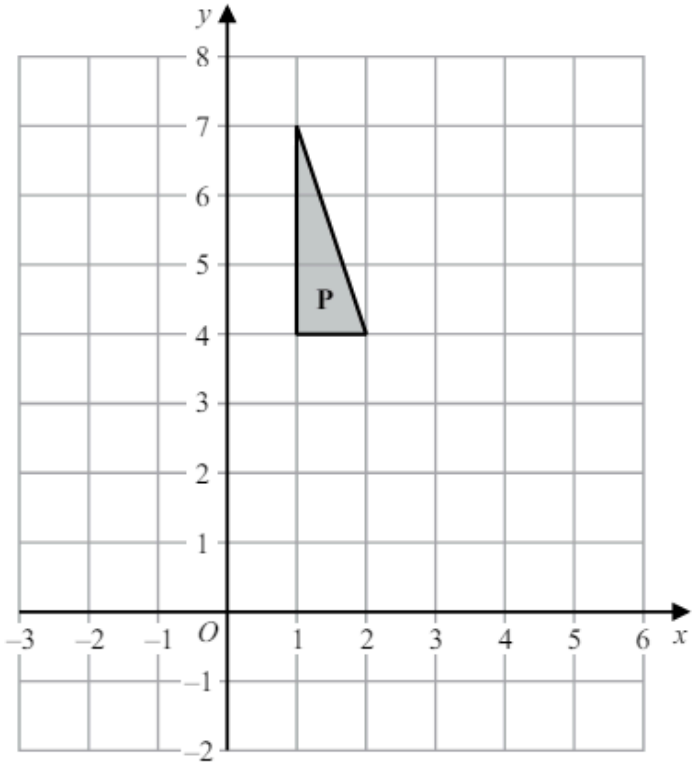
(Total for Question 16 is 2 marks)



On the grid, draw an enlargement of the shaded shape with a scale factor of 3

(Total for Question 13 is 2 marks)

18



Reflect shape **P** in the line $y = 3$

(Total for Question 18 is 2 marks)

Unit 11 – RATIO AND PROPORTION

13 In the Northern hemisphere the ratio of the area of land to the area of water is 2 : 3

(a) Work out what percentage of the area of the Northern hemisphere is land.

.....%

(2)

20% of the area of the Southern hemisphere is land.

(b) Work out the ratio of the area of land to the area of water in the Southern hemisphere.

.....

(2)

22 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

weight of potato : weight of cheese : weight of onion = 9 : 2 : 1

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

£.....

(Total for Question 22 is 4 marks)

15 The length of a plane is 19.2 metres.

Lukas buys a scale model of the plane.
The scale of the model is 1 : 24

Work out the length of the scale model of the plane.
Give your answer in centimetres.

..... centimetres

(Total for Question 15 is 3 marks)

23 Tom and Adam have a total of 240 stamps.
The ratio of the number of Tom's stamps to the number of Adam's stamps is 3 : 7

Tom buys some stamps from Adam.
The ratio of the number of Tom's stamps to the number of Adam's stamps is now 3 : 5

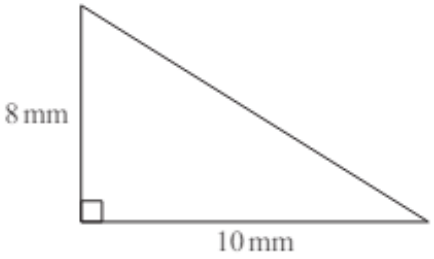
How many stamps does Tom buy from Adam?
You must show all your working.

.....

(Total for Question 23 is 4 marks)

Unit 12 – RIGHT-ANGLED TRIANGLES

25 Here is a right-angled triangle.



The shaded shape below is made from two of these triangles.

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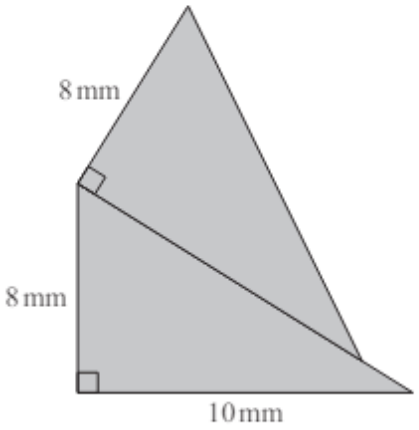
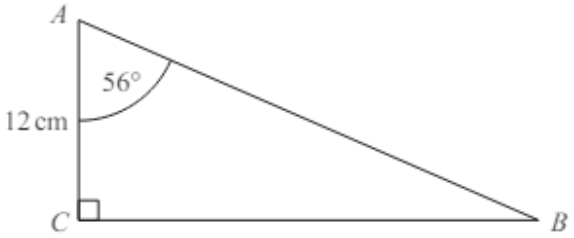


Work out the perimeter of the shaded shape.
Give your answer correct to 3 significant figures.

..... mm

(Total for Question 25 is 4 marks)

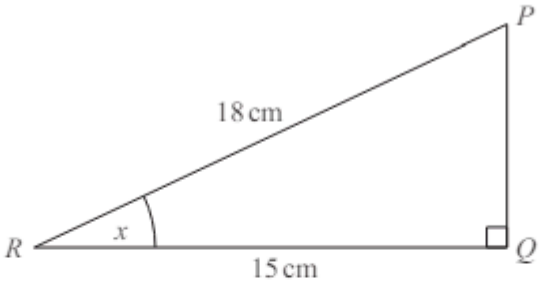
26 *ABC* is a right-angled triangle.



(a) Work out the length of *BC*.
Give your answer correct to 1 decimal place.

..... cm
(2)

PQR is a right-angled triangle.

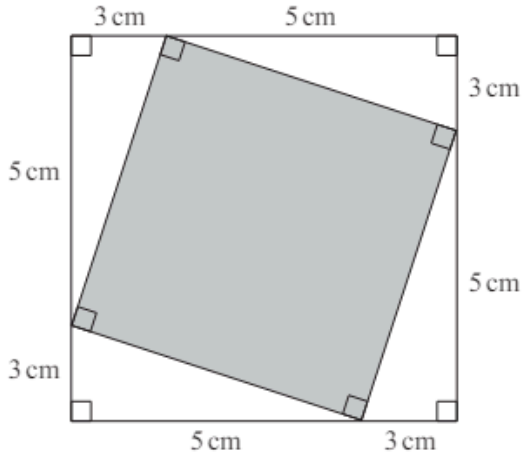


(b) Work out the size of the angle marked *x*.
Give your answer correct to 1 decimal place.

.....
(2)

(Total for Question 26 is 4 marks)

19 This diagram shows two squares.

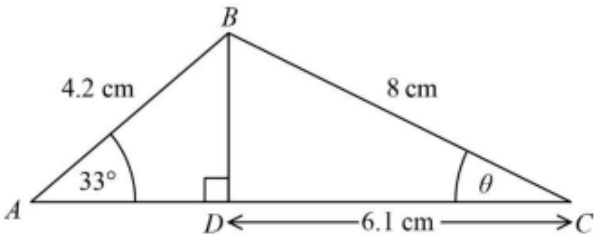


Work out the area of the square shown shaded in the diagram.

.....

(Total for Question 19 is 4 marks)

8



a Calculate the length of AD.

Give your answer correct to 3 significant figures.

_____

(3 marks)

Unit 13 – PROBABILITY

26 In a bag there are only red counters, blue counters, green counters and pink counters. A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15	.....	.....

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

(a) Complete the table.

(2)

There are 18 blue counters in the bag.

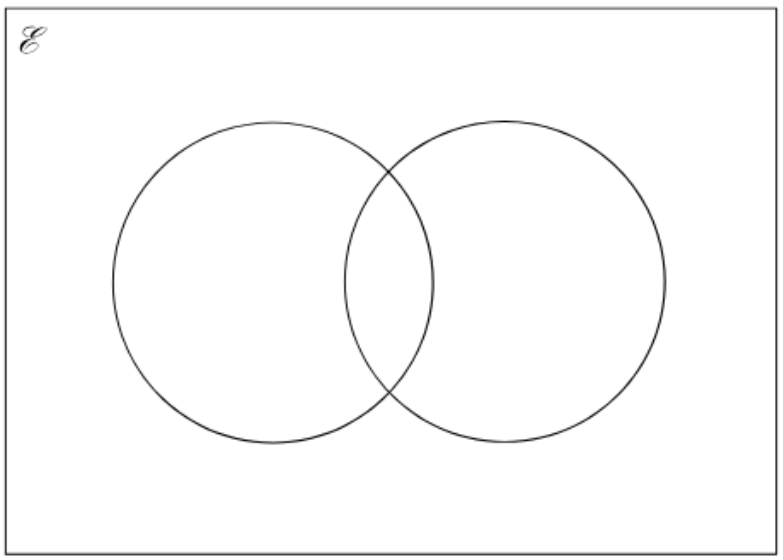
(b) Work out the total number of counters in the bag.

.....

(2)

20 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}
A = {multiples of 3}
B = {even numbers}

Complete the Venn diagram for this information.

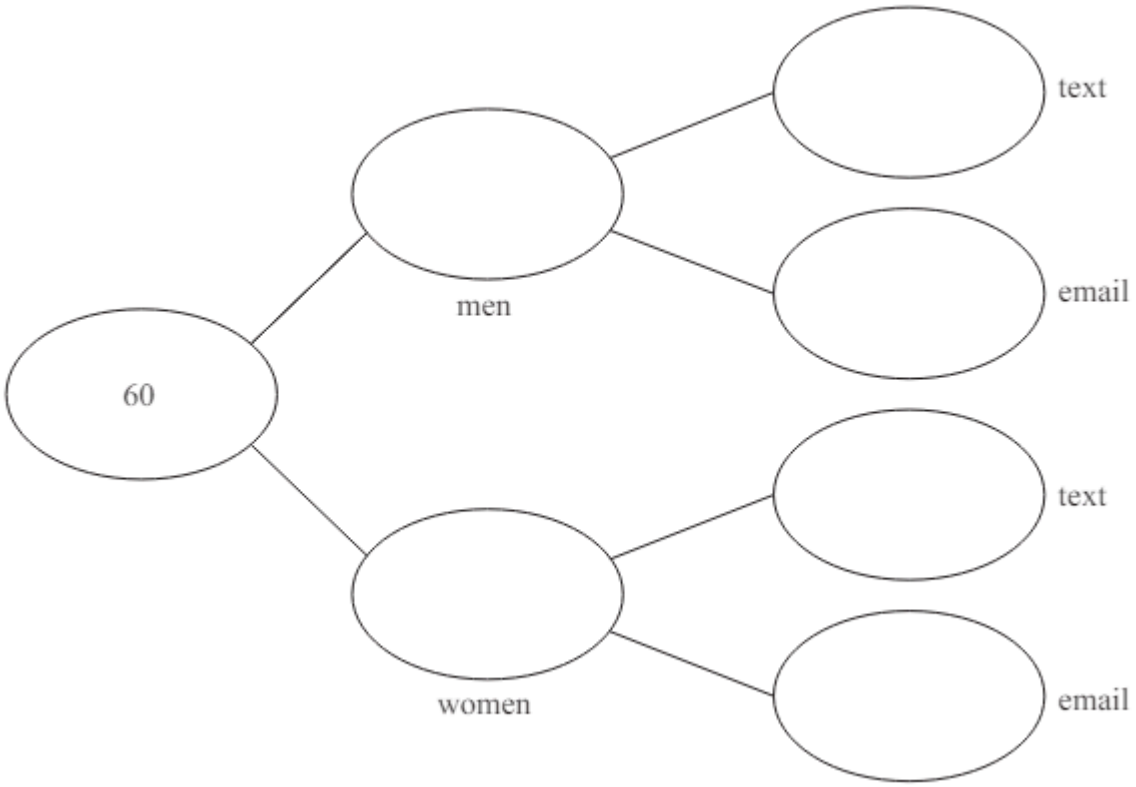


(Total for Question 20 is 4 marks)

17 60 people are asked if they prefer to text or to email their friends.

38 of the people are women and the rest are men.
15 of the men prefer to email their friends.
60% of the people prefer to text their friends.

Complete the frequency tree for this information.

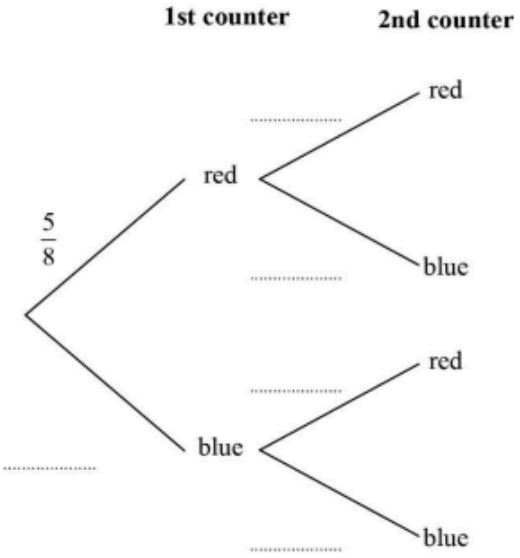


(Total for Question 17 is 5 marks)

13 Flo has a bag containing five red countrers and three blue counters.

Flo takes one counter from the bag, replaces it and then takes a second counter.

a Complete this tree diagram.



(2 marks)

Unit 14 – MULTIPLICATIVE REASONING

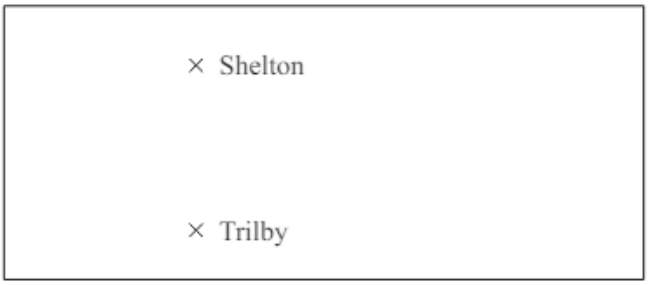
28 In a sale, the normal price of a boat is reduced by 15%
The sale price of the boat is £272 000

Work out the normal price of the boat.

£.....

(Total for Question 28 is 2 marks)

12 The diagram shows two places on a map.



Scale: 1 centimetre represents 20 kilometres

(a) What is the actual distance, in kilometres, from Shelton to Trilby?

..... kilometres
(2)

On a scale drawing, the scale is given as 1 : 1200

(b) How many metres does 5 centimetres represent on this drawing?

..... metres
(2)

10 Here is the charge at a car park in Spain.

Car park
0.024 euros per minute

Jon parked his car in this car park.

Jon drove into the car park at 10 45
When he drove out of the car park he had to pay 8.40 euros.

At what time did Jon drive out of the car park?

.....

(Total for Question 10 is 3 marks)

16 Maria invests £4500 in a savings account for 3 years.
The account pays simple interest at a rate of 1.8% per year.

Work out the total amount of interest Maria gets by the end of the 3 years.

£.....

(Total for Question 16 is 2 marks)

21 Franco buys a house for £146 500
He sells the house for £158 220

Calculate the percentage profit Franco makes.

..... %

(Total for Question 21 is 3 marks)