1 QUESTION ON EVERY TOPIC
GCSE FOUNDATION

Video Solutions

SCAN ME

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1 (a) Write the following numbers in order of size.
Start with the smallest number.

-4 6 0 -1 5 -3

.....

(1)

(b) Write the following numbers in order of size.
Start with the smallest number.

0.43 0.34 0.4 0.334

.....

(1)

(Total for Question 1 is 2 marks)

2 (a) Write 927 to the nearest 10

.....

(1)

(b) Write 17.512 to the nearest integer

.....

(1)

(Total for Question 2 is 2 marks)

3 Work out the value of 2^4

.....

(Total for Question 3 is 1 mark)

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4 (a) Change 7 kilograms into grams

..... grams

(1)

(b) Change 450 cm into metres.

..... metres

(1)

(Total for Question 4 is 2 marks)

5 Write down the value of the number 7 in the number 5721

.....

(Total for Question 5 is 1 mark)

6 Here are the first 4 terms of a sequence.

11 8 5 2

(a) (i) Write down the next term in the sequence.

.....

(1)

(ii) Explain how you got your answer.

.....

.....

(1)

(b) Work out the 10th term of the sequence.

.....

(1)

(Total for Question 6 is 3 marks)

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7 Here is a list of numbers

5 6 8 9 20 24

(a) From the list of numbers write down a prime number

.....

(1)

(b) From the list of numbers write down a square number

.....

(1)

(c) From the list of numbers write down a multiple of 10

.....

(1)

(d) From the list of numbers write down a factor of 12

.....

(1)

(e) From the list of numbers write down the largest odd number.

.....

(1)

(Total for Question 7 is 5 marks)

8 Expand $6(y - 2)$

.....

(Total for Question 8 is 1 mark)

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9 Work out $\frac{3}{4}$ of 80

.....

(Total for Question 9 is 1 mark)

10 Complete the following table.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{3}{10}$		
		7%

(Total for Question 10 is 4 marks)

11 (a) Work out $3 + 5 \times 2$

.....

(1)

(b) Work out $10 - 5 + 3$

.....

(1)

(Total for Question 11 is 2 marks)

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

.....

(1)

(b) Simplify $5 \times p \times 4 \times p$

.....

(1)

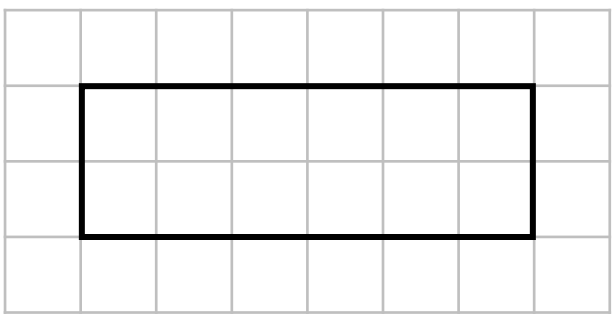
(c) Simplify $10x - y - 2x + 4y$

.....

(2)

(Total for Question 12 is 4 marks)

13 A rectangle is drawn on grid below.
The area of each square is 1 cm^2



(a) Work out the perimeter of the shape.

..... cm

(1)

(b) Work out the area of the shape.

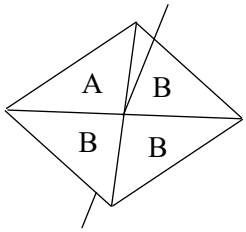
..... cm^2

(1)

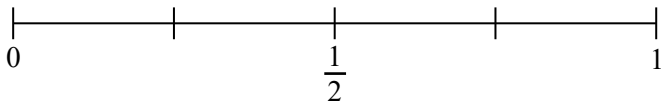
(Total for Question 13 is 2 marks)

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14 A fair spinner made from a square is shown below.

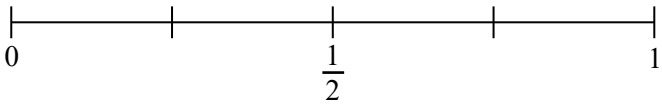


(a) On the probability scale below, mark with a cross (×) the probability that the spinner lands on a letter B



(1)

(b) On the probability scale below, mark with a cross (×) the probability that the spinner lands on a letter C



(1)

(Total for Question 14 is 2 marks)

15 Work out 35% of 140



.....

(Total for Question 15 is 2 marks)

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16 The prices of different items in a school shop are shown below.



Ruler	12p
Pen	8p
Pencil	6p

(a) Work out the cost of 32 rulers.

£ .....

(2)

(b) Work out how many pens can be bought with £2.16

..... pens

(2)

Annie buys 10 rulers and 4 pencils.
She pays with a £2 coin.

(c) Work out how much change Annie gets.

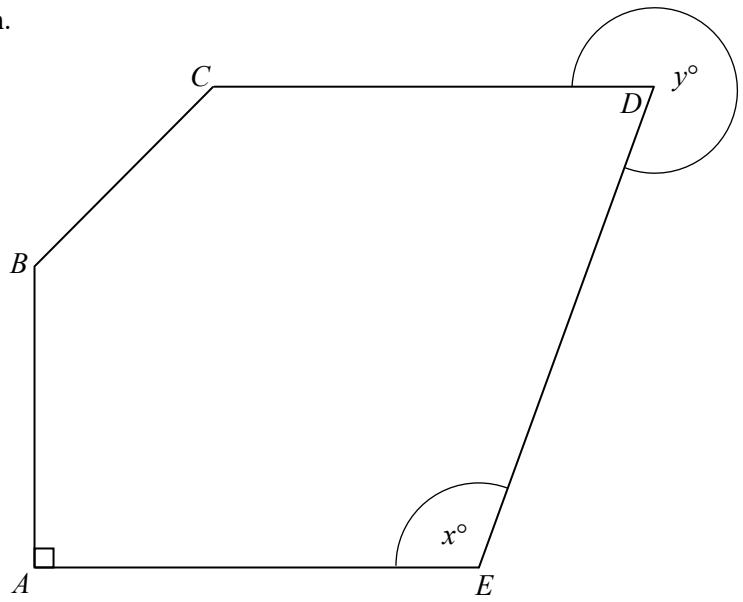
£ .....

(3)

(Total for Question 16 is 7 marks)

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17 *ABCDE* is a pentagon.



(a) Measure the length of the line *BC*.
Give your answer in cm.

..... cm
(1)

(b) Measure the size of the angle marked *x*.

°
(1)

(c) Write down the line that is parallel to line *AE*.

.....
(1)

(d) Write down the line that is perpendicular to line *AE*.

.....
(1)

Angle *CDE* = *y*° is marked on the diagram.
(e) Write down the mathematical name for this type of angle

.....
(1)

(Total for Question 17 is 5 marks)

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18 The table below shows the favourite subjects of 25 students.

Subject	Frequency
Maths	10
English	6
Science	1
History	8

(a) Write down the fraction of the students whose favourite subject is maths.
Give your answer in its simplest form.

.....

(2)

(b) Write down the ratio of students whose favourite subject is maths to those whose favourite subject is history.
Give your answer in its simplest form.

.....

(2)

(c) Work out the percentage of students whose favourite subject is English.

..... %

(2)

(Total for Question 18 is 6 marks)

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19 The table below shows the temperatures of some cities on a day in December.

City	Temperature
London	3 °C
Glasgow	–5 °C
Newcastle	–3 °C
Nottingham	2 °C

(a) Write down the city with the lowest temperature.

.....

(1)

(b) Work out the range of the temperatures of the cities.

..... °C

(2)

The following day the temperature in Glasgow increased by 4° C

(c) Write down the temperature in Glasgow the following day.

..... °C

(1)

(Total for Question 19 is 4 marks)

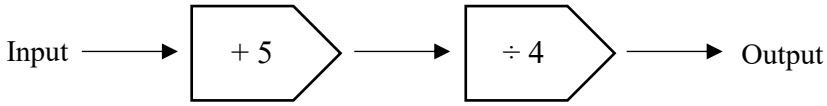
20 A company produces drinking bottles.
The ratio of recycled material to non-recycled material in each bottle is 5 : 3
Write down the fraction of each bottle that is made from recycled material.

.....

(Total for Question 20 is 1 mark)

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21 The diagram shows a number machine.



(a) Find the output when the input is 19.

.....

(1)

(b) Find the input when the output is 1.

.....

(2)

(Total for Question 21 is 3 marks)

22 Here is a list of numbers

11 3 16 2 7 3

(a) Write down the mode of the numbers.

.....

(1)

(b) Work out the median of the numbers.

.....

(2)

(c) Work out the mean of the numbers.

.....

(2)

(Total for Question 22 is 5 marks)

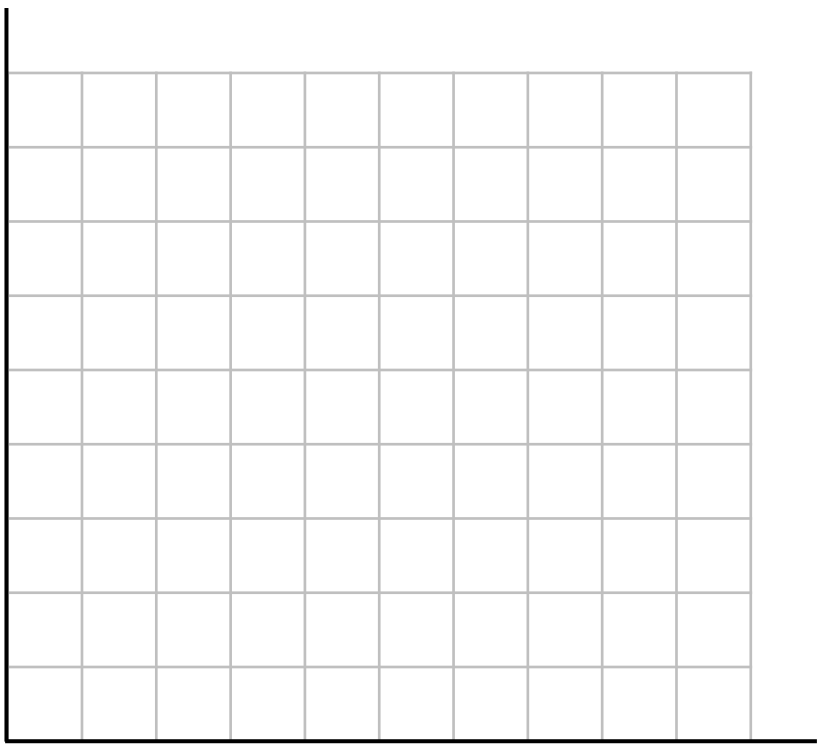
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23 30 students were asked how they travel to school.

The table shows the results.

Transport Method	Frequency
Car	16
Bike	4
Bus	7
Walk	3

On the grid below, draw a bar chart for this information.



(Total for Question 23 is 3 marks)

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24 (a) Solve $x - 4 = 12$

$x =$ .....

(1)

(b) Solve $3y = 27$

$y =$ .....

(1)

(c) Solve $\frac{h}{2} = 10$

$h =$ .....

(1)

(Total for Question 24 is 3 marks)

25 Juliet is having her photo taken.

She must choose the size of her photo and the colour.

Photo Information	
Photo Size	**Colour**
Small Medium Large	Full Colour Black and White

Write down all the possible combinations Juliet can choose.

.....

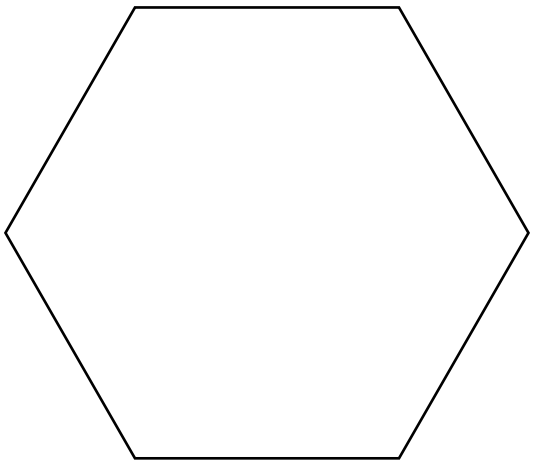
.....

.....

(Total for Question 25 is 2 marks)

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26 Here is a regular polygon



(a) Write down the name of this regular polygon.

.....

(1)

(b) Write down the order of rotational symmetry for this regular polygon

.....

(1)

(c) Draw all the lines of symmetry onto the regular polygon above.

(1)

(Total for Question 26 is 3 marks)

27 A film starts at 4:12pm and lasts for 1h 49 minutes.

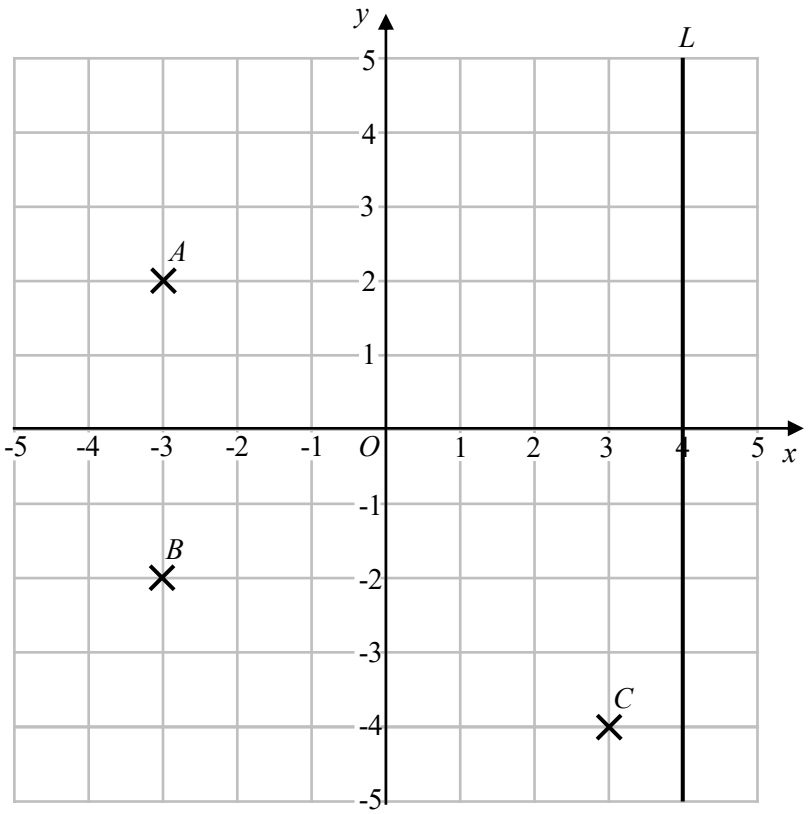
Work out the time that the film finishes.

..... pm

(Total for Question 27 is 2 marks)

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28



(a) Write down the coordinates of point A.

(.....,.....)

Point D is such that $ABCD$ forms a kite. **(1)**

(b) Write down the coordinates of point D.

(.....,.....)

(c) Write down the coordinates of the midpoint of the line AC. **(2)**

(.....,.....)

(d) Write down the equation of the line L. **(2)**

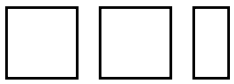
.....

(1)

(Total for Question 28 is 6 marks)

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29 The pictogram shows the number of books sold in a shop on different days.

Monday	
Tuesday	
Wednesday	

Key:



represents 20 books

(a) Write down the number of books sold on Monday

.....

(1)

15 more books were sold on Tuesday than on Monday.
The total number of books sold on Monday, Tuesday and Wednesday was 150

(b) Use this information to complete the pictogram.

(3)

(Total for Question 29 is 4 marks)

30 A bag contains 50 counters that are only red, blue or green.
There are 28 red counters.
There are twice as many red counters as blue counters.

A counter is selected at random.
Work out the probability that the counter selected is green.

.....

(Total for Question 30 is 3 marks)

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31 Use your calculator to work out $\dfrac{1.8^3}{\sqrt{17}-2}$

(a) Write down all the figures on your calculator display.

.....

(2)

(b) Write your answer to part (a) correct to 3 significant figures.

.....

(1)

(Total for Question 31 is 3 marks)

32 (a) Work out $\dfrac{3}{5} \div \dfrac{9}{10}$



Give your answer as a fraction in its simplest form.

.....

(2)

(b) Work out $\dfrac{2}{3} - \dfrac{2}{9}$

Give your answer as a fraction in its simplest form.

.....

(2)

(Total for Question 32 is 4 marks)

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33 Two companies run bus services in a town.
The council wants to know which company is performing better so they tracked the arrival time of 40 buses from each company.

12 of company A's buses and 7 of company B's buses were late.
31 of company B's buses were on time.
5 buses were early.

Complete the two-way table.

	Early	On-time	Late	Total
Company A				
Company B				
Total				

(Total for Question 33 is 3 marks)

34 £1 = 1.16 Euros

Paul changes £400 into Euros for his holiday to Spain.
Whilst on holiday he spends 319 Euros.
After his holiday he converts his remaining Euros back into pounds.

Work out how much money Paul has after his holiday, in pounds.

£.....

(Total for Question 34 is 3 marks)

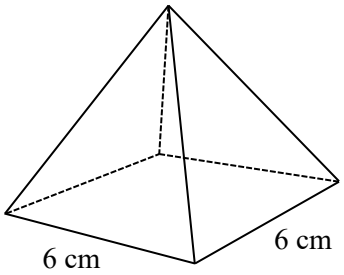
35 Write down a cube number between 100 and 200.

.....

(Total for Question 35 is 1 mark)

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36 Here is a square based pyramid.



(a) Write down the number of faces the square-based pyramid has.

.....

(1)

(b) Write down the number of edges the square-based pyramid has.

.....

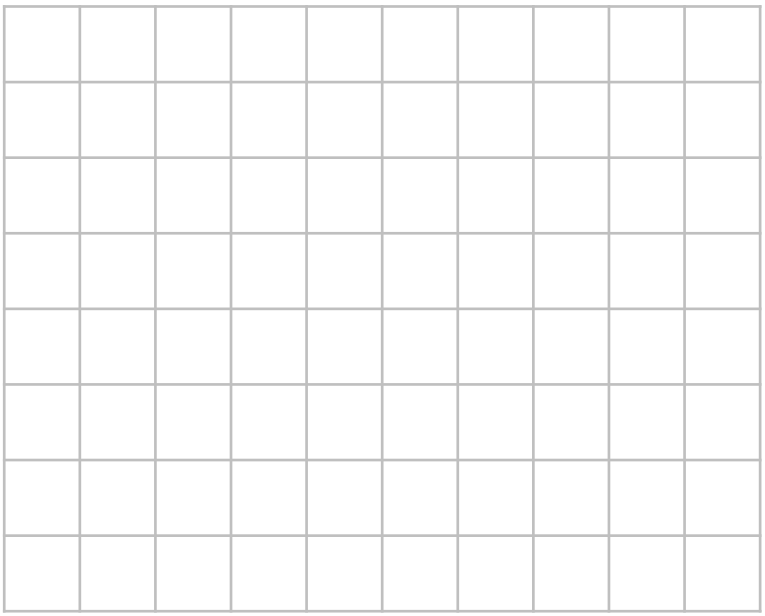
(1)

(c) Write down the number of vertices the square-based pyramid has.

.....

(1)

(d) On the centimetre grid below, draw the plan of the square-based pyramid.



(2)

(Total for Question 36 is 5 marks)

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37 (a) Factorise $t^2 + 6t$

.....

(1)

(b) Solve $5(x - 3) = 15$

$x =$ .....

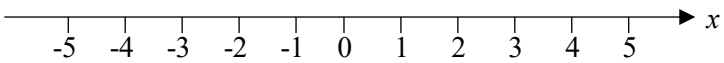
(2)

(c) Solve $2x < 8$

.....

(1)

(d) Represent your answer to part (c) on the number line below.



(2)

(e) $-4 \leq p < 2$
p is an integer

Write down all the possible values for p

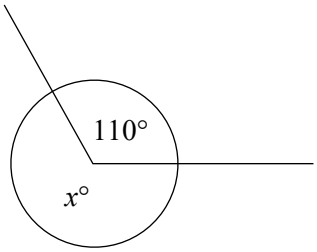
.....

(2)

(Total for Question 37 is 8 marks)

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38



(a) Find the value of x.

$x =$ ..... °

(2)

(b) Give a reason for your answer to part (a).

.....

.....

(1)

(Total for Question 38 is 3 marks)

39 An ice cream shop has the following offer.



80p per scoop.



Buy 3 scoops and get 15% off.

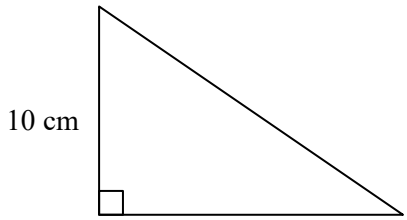
Work out the cost of an ice cream with 3 scoops.

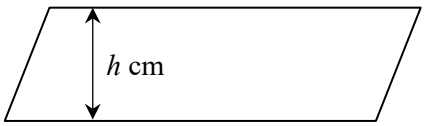
£ .....

(Total for Question 39 is 3 marks)

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40 The triangle and parallelogram shown below have the same area.





The parallelogram has a height h cm.
Work out the value of h.

$h =$ ..... cm

(Total for Question 40 is 3 marks)

41 Write the following fractions in order of size.
Start with the smallest.



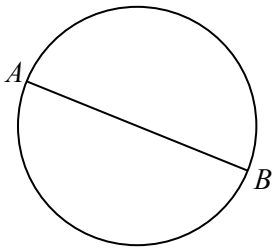
$\frac{7}{10}$ $\frac{3}{5}$ $\frac{11}{20}$ $\frac{3}{4}$

.....

(Total for Question 41 is 2 marks)

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42 Here is a circle with diameter AB.



$AB = 10$ cm.

(a) Calculate the area of the circle.
Give your answer in terms of π

.....cm^2
(2)

(b) Calculate the circumference of the circle.
Give your answer in terms of π

.....cm
(2)

(Total for Question 42 is 4 marks)

43 (a) Simplify $p^6 \times p^3$

.....
(1)

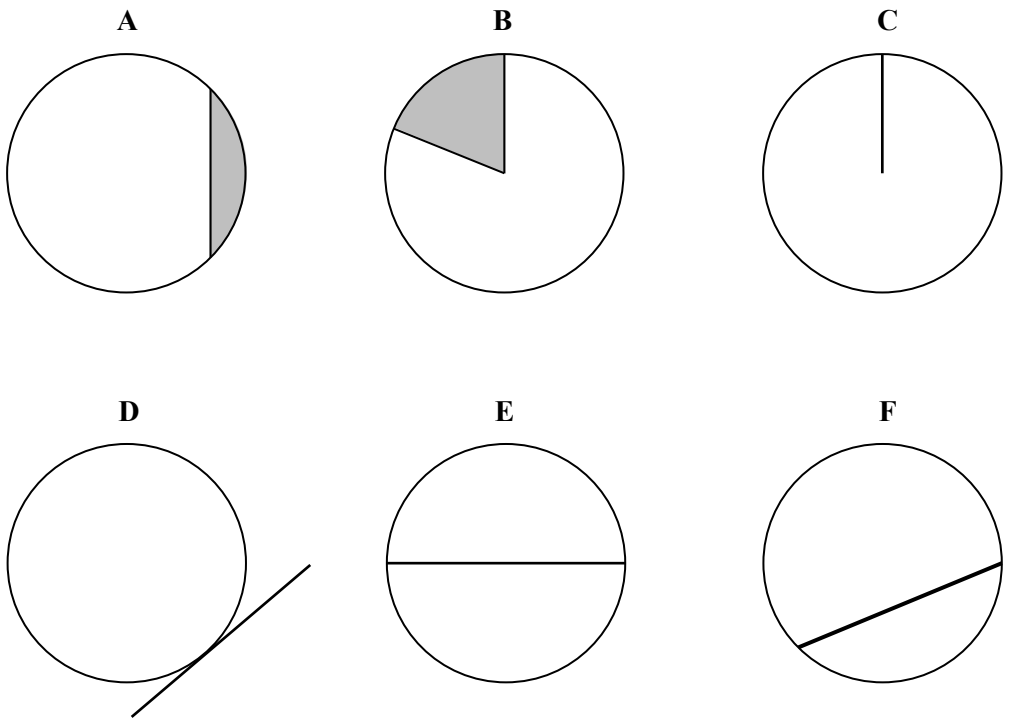
(b) Simplify $\frac{q^{20}}{q^5}$

.....
(1)

(Total for Question 43 is 2 marks)

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44 The diagrams below show different parts of a circle.



Each of the parts of a circle from the diagrams above is also in the table below.

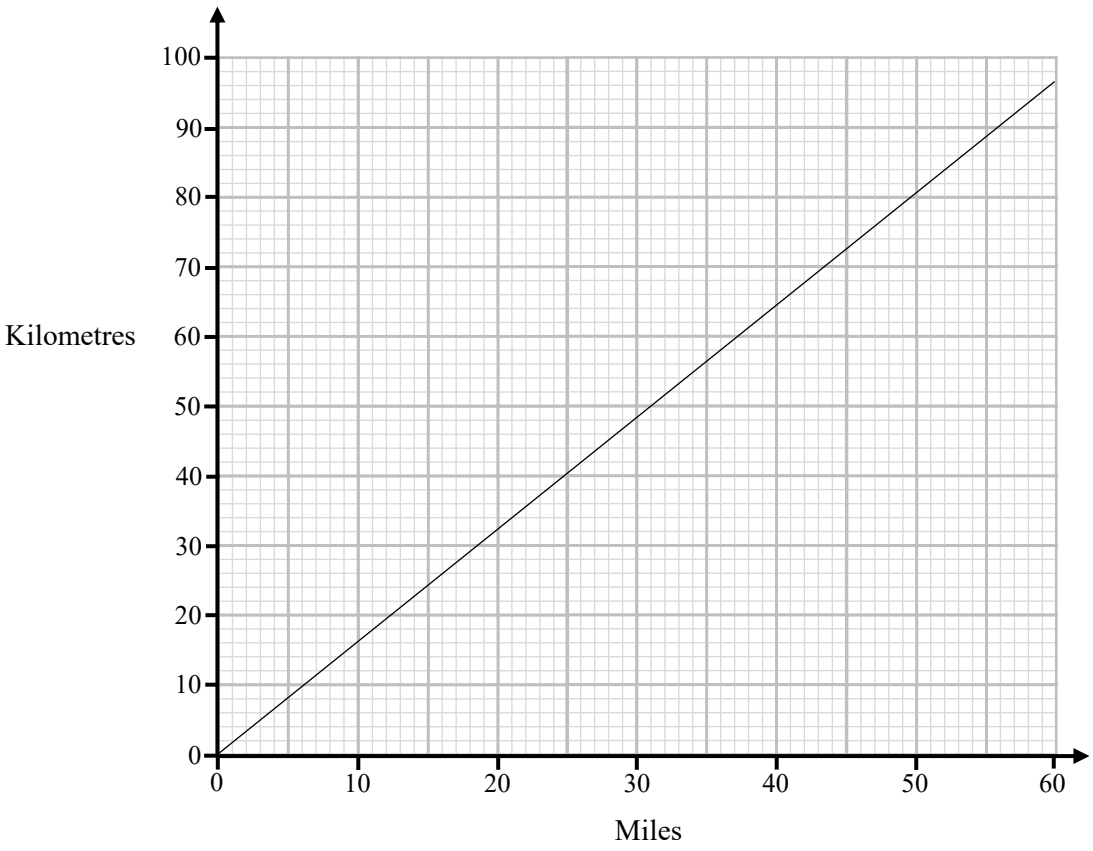
Complete the table.

Part of a Circle	Letter of Diagram
Diameter	E
Tangent	
Radius	
Segment	
Chord	
Sector	

(Total for Question 44 is 4 marks)

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45 You can use this graph to change between miles and kilometres.



(a) Change 45 miles into kilometres

..... kilometres
(1)

Jim is trying to cycle his bike 300 miles for charity.
So far he has cycled 250 kilometres.
(b) Calculate how many more **miles** Jim needs to ride to complete the total of 300 miles.

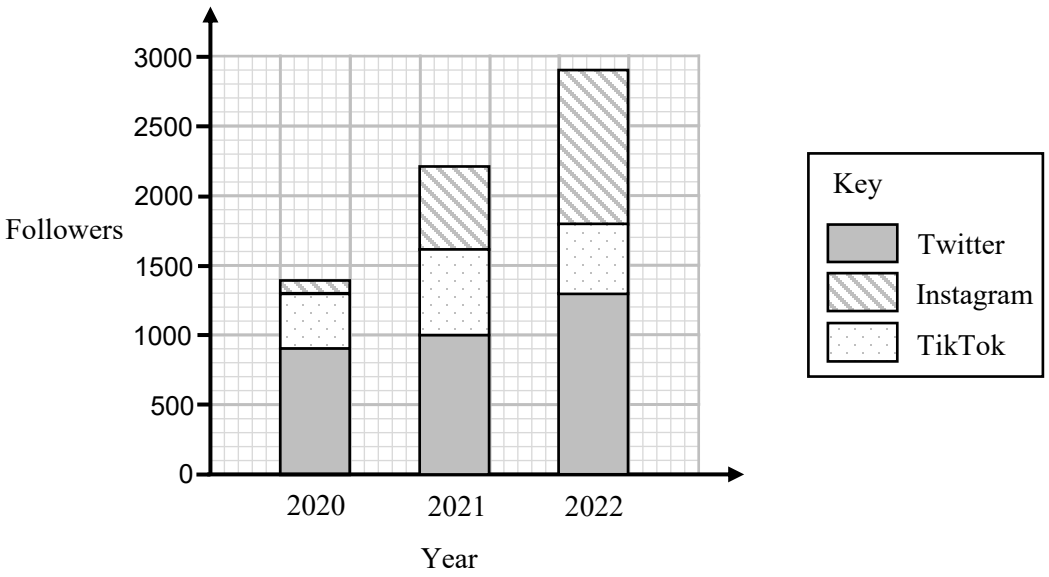
..... miles
(3)

(Total for Question 45 is 4 marks)

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46 Rachel tracks how many followers she has on different social media networks.

The composite bar chart shows information about her followers for three different years.



(a) Write down how many Twitter followers Rachel had in 2022.

.....

(1)

(b) Work out how many more Instagram followers Rachel had in 2022 compared to 2021.

.....

(2)

Rachel says: "My number of followers increased each year on all social media networks".

(c) Is Rachel correct? Give a reason for your answer.

.....

.....

(1)

(Total for Question 46 is 4 marks)

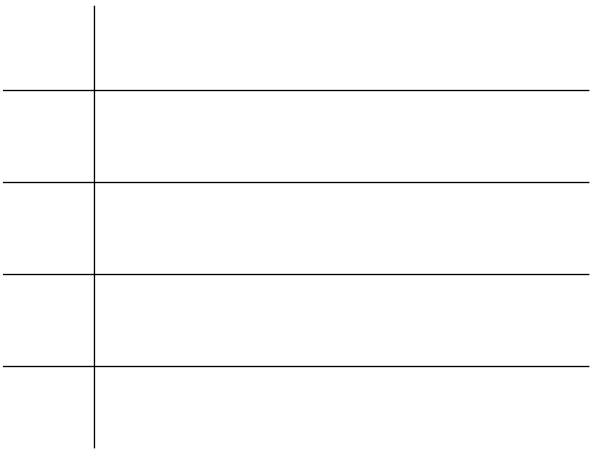
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47 Here are the percentage test scores of 20 students in a school.

81	63	66	60	70	77	77	70	66	82
92	88	59	84	80	71	64	61	73	73

(a) Show this information in a stem and leaf diagram.

(3)



One of the 20 students is chosen at random.

(b) Write down the probability that this student has scored more than 70% on their test.

.....

(1)

(Total for Question 47 is 4 marks)

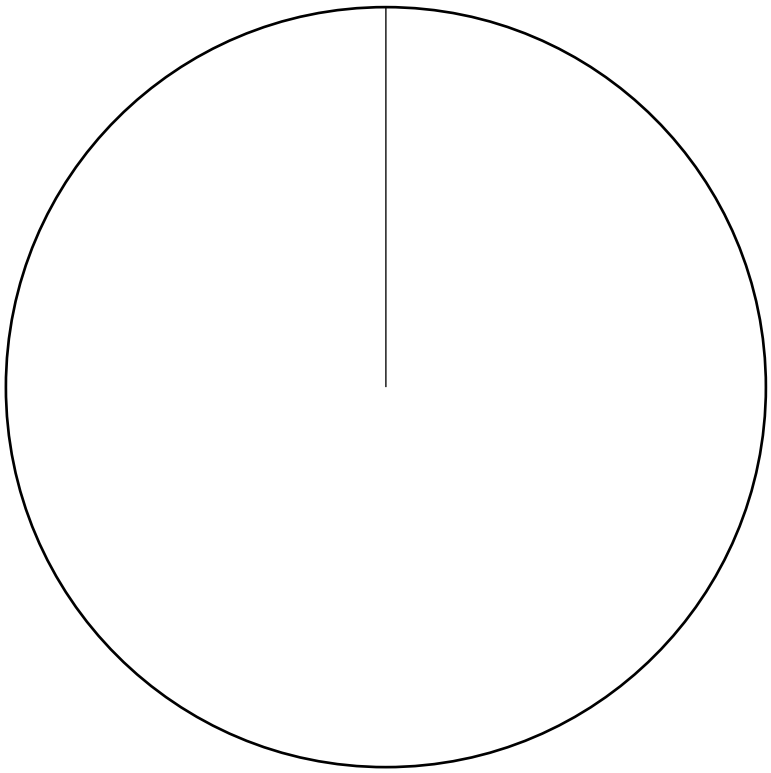
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Solutions

48 The table below shows information about the positions of members of a football squad.

Position	Frequency
Goalkeeper	3
Defender	7
Midfielder	9
Forward	5

Draw an accurate pie chart for this information.



(Total for Question 48 is 3 marks)

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Solutions

49 Here is a map of an island.

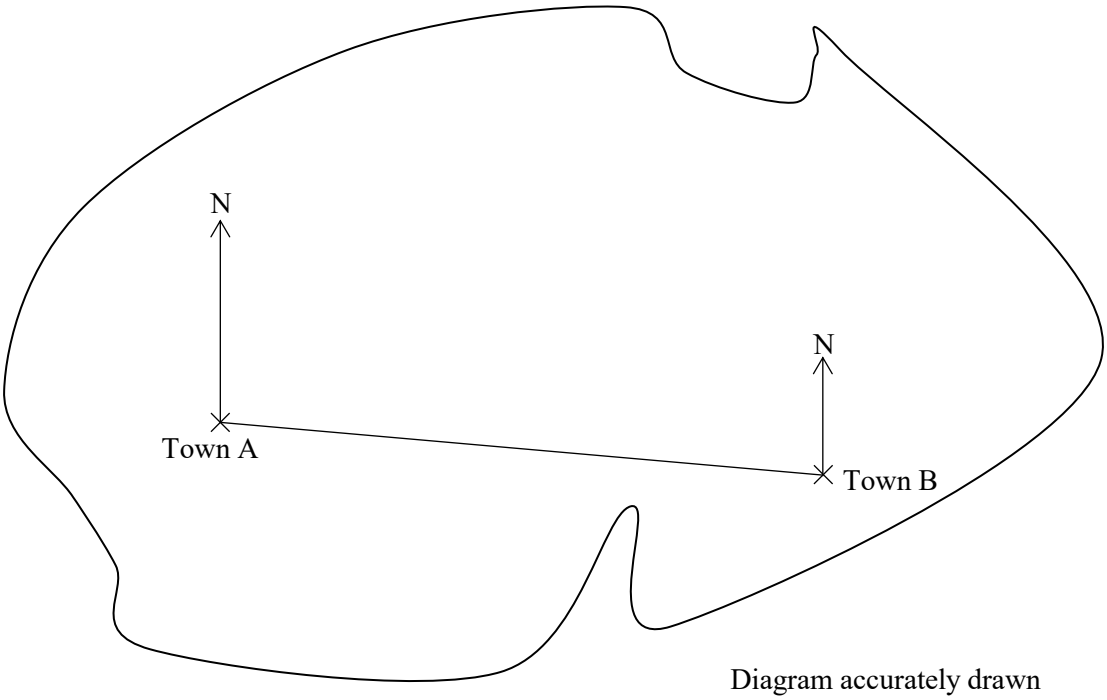


Diagram accurately drawn

Scale: 1 cm represent 4 km

A straight road joins Town A and Town B.

(a) Work out the real distance between the two towns.

..... km

(2)

(b) Find the bearing of Town B from Town A.

°

.....

(1)

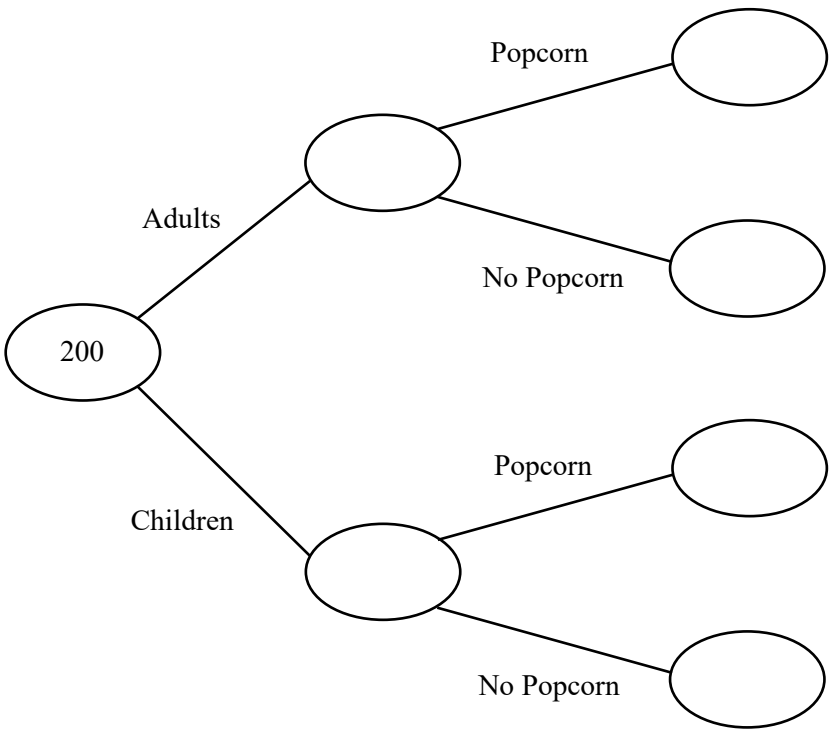
(Total for Question 49 is 3 marks)

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50 200 people went to watch a film.

95 of the people were adults and the rest were children.
54 of the adults had popcorn.
52 people had no popcorn.

(a) Use this information to complete the frequency tree.



(3)

One of the 200 people is chosen at random.

(b) Write down the probability that this person is an adult who had popcorn.

.....

(1)

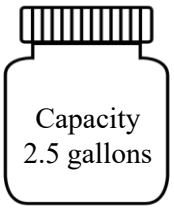
(Total for Question 50 is 4 marks)

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51 1 gallon = 4.55 litres
1 litre = 1.75 pints

Fiona has the two containers shown below.

Container A



Container B



Which container has the greatest capacity?
You must show all your working.

.....

(Total for Question 51 is 2 marks)

52

$2(x + 3) = 2x + 6$	$4x + 3 = 9$	$F = ma$
$x^2 + 4x - 5 = 0$	$x - 3 < 7$	$7c - p$

From the boxes above write down

(a) A formula

.....
(1)

(b) An identity

.....
(1)

(c) An inequality

.....
(1)

(d) An expression

.....
(1)

(Total for Question 52 is 4 marks)

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Solutions

53 A can of drink has 330 ml
A bottle of drink has 500 ml

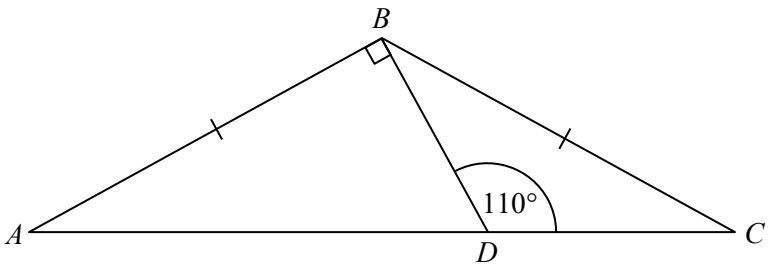
Sandra buys p cans of drink and q bottles of drink.

Write down an expression, in terms of p and q, for the total amount of millilitres of drink Sandra has.

.....

(Total for Question 53 is 2 marks)

54



ABC is a triangle.
AB = BC
Angle BDC = 110°
Work out the size of angle DBC.

°

.....

(Total for Question 54 is 4 marks)

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Solutions

55 $P = 3m + 30$

(a) Work out the value of P when $m = 5$

.....

(2)

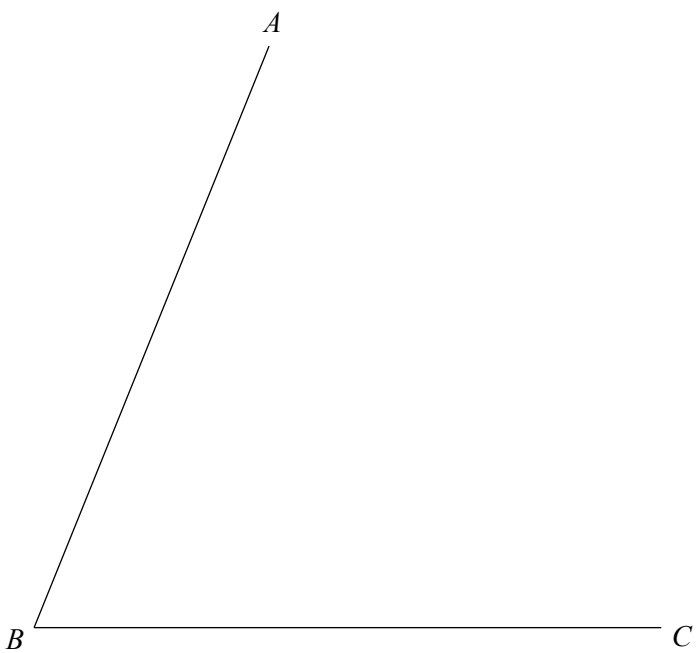
(b) Work out the value of m when $P = 18$

.....

(2)

(Total for Question 55 is 4 marks)

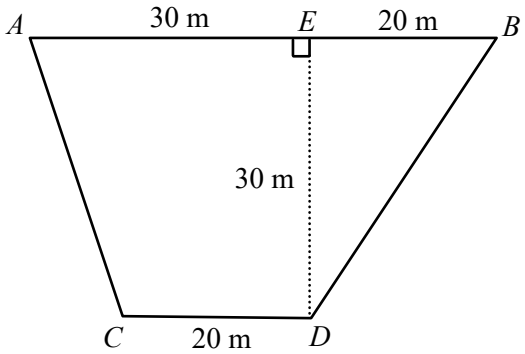
56 Use a ruler and compasses to construct the line BP that bisects the angle ABC.
You must show **all** construction lines.



(Total for Question 56 is 2 marks)

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57 Here is a trapezium $ABCD$



$AE = 30$ m
$EB = 20$ m
$CD = 20$ m
$DE = 30$ m

(a) Work out the area of trapezium $ABCD$.
Give your answer in square metres.

..... m^2
(2)

(b) On the centimetre grid below, draw a scale drawing of trapezium $ABCD$.
Use a scale of 1 cm to 5 m.

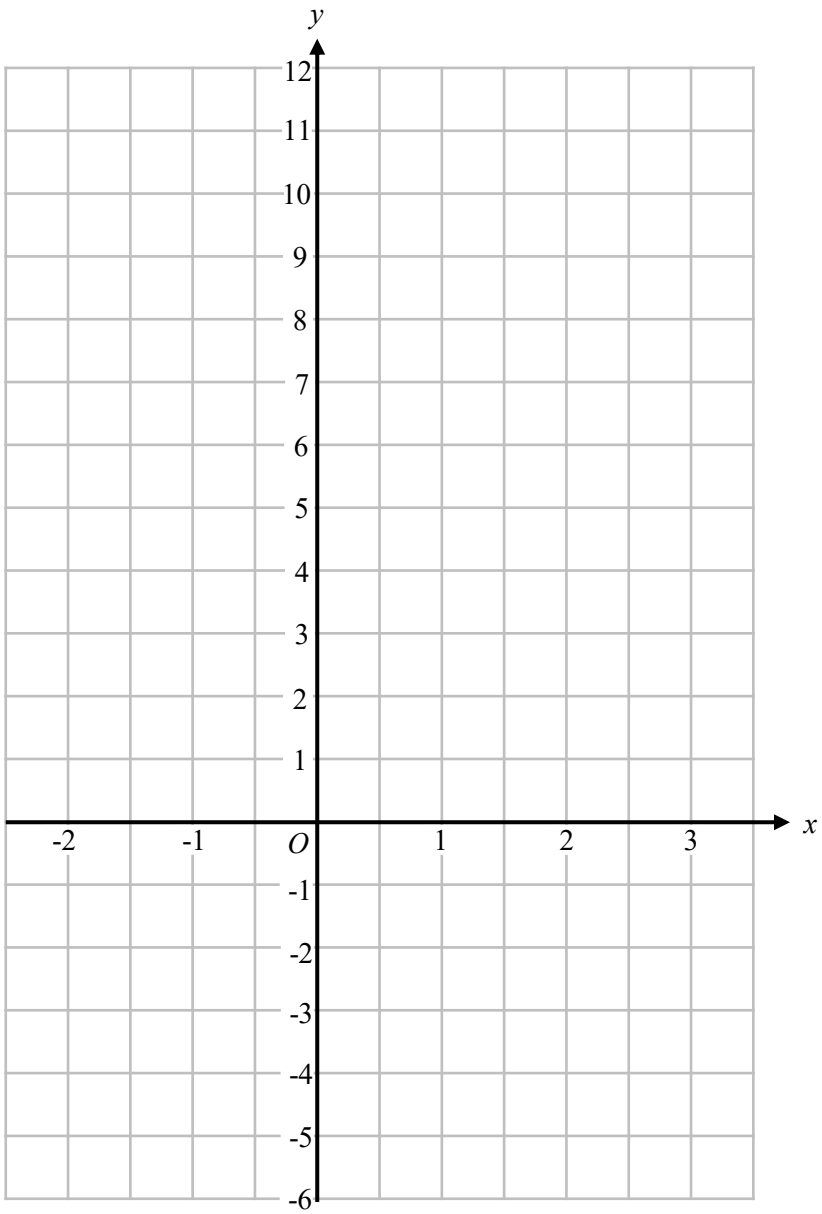


(3)

(Total for Question 57 is 5 marks)

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58 (a) On the grid below, draw the graph of $y = 3x + 2$ for values of x from -2 to 3



(3)

(b) Does the point with coordinates (25, 77) lie on the line $y = 3x + 2$?
You must show how you get your answer.

.....

.....

(1)

(Total for Question 58 is 4 marks)

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59 Here are the first four terms of an arithmetic sequence.

8 11 14 17

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

.....

(2)

(b) Is 98 a number in this sequence?
Give a reason for your answer.

.....

.....

(1)

The nth term of another sequence is given by the expression $30 - 2n$

(c) Find the 8^{th} term of this sequence.

.....

(2)

(Total for Question 59 is 5 marks)

60 Write 700 as a product of its prime factors.

.....

(Total for Question 60 is 2 marks)

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61 Use a ruler and compasses to construct an equilateral triangle with a side length of 7 cm.

(Total for Question 61 is 2 marks)

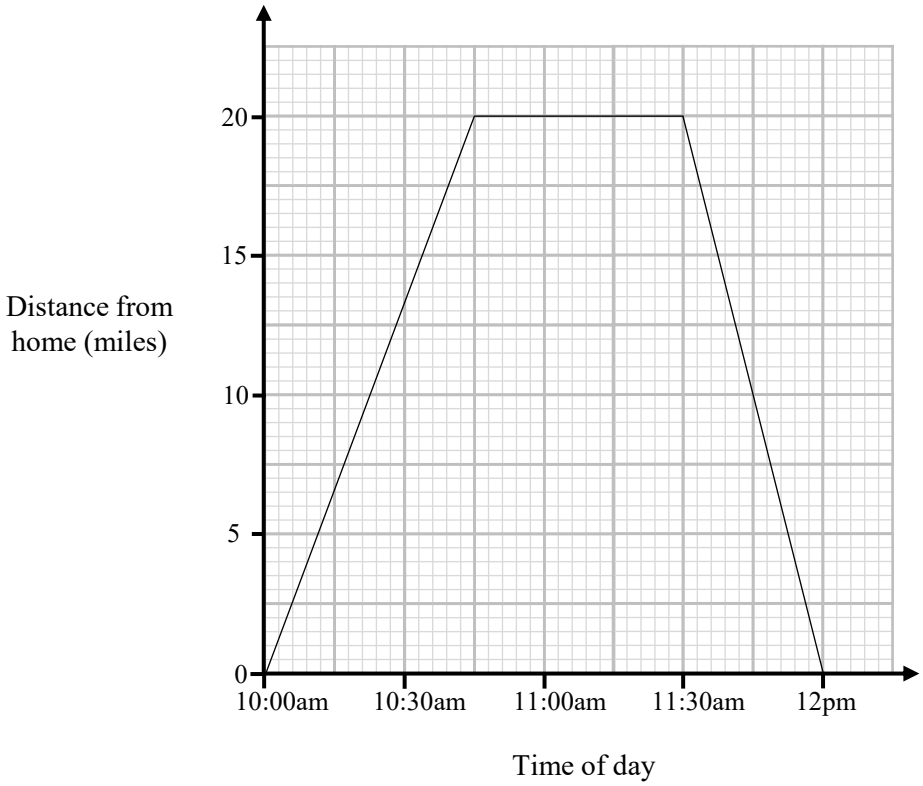
62 Work out an estimate for $\frac{699 \times 32}{19.79}$

.....

(Total for Question 62 is 3 marks)

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63 Sovra drove from her home to the dentist.
She stayed at the dentist for her appointment and then drove home.



(a) How far does Sovra live from the dentist?

..... miles
(1)

(b) How many minutes was Sovra's appointment?

..... minutes
(1)

(c) What was Sovra's average speed on the journey home?

..... mph
(2)

(Total for Question 63 is 4 marks)

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64 Here are the first three terms of a Fibonacci sequence.



2 3 5

(a) Find the 4th term of the sequence.

.....

(1)

Here are the first three terms of a geometric sequence.

1 3 9

(b) Find the 4th term of the sequence.

.....

(1)

Here are the first four terms of a quadratic sequence.

2 5 10 17

(c) Find the 5th term of the sequence.

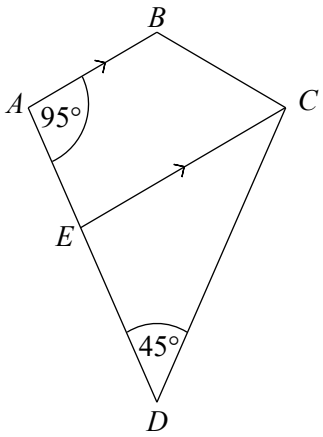
.....

(2)

(Total for Question 64 is 4 marks)

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65



ABCD is a kite.
AB is parallel to *EC*.
Angle *BAE* = 95°
Angle *EDC* = 45°
Work out the size of angle *BCE*.

.....
°

(Total for Question 65 is 4 marks)

66 Chloe buys a phone for £120.

She sells it for £138.

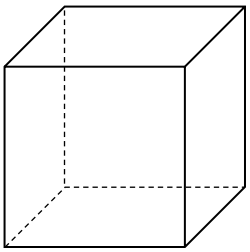
Work out Chloe's percentage profit.

.....
%

(Total for Question 66 is 2 marks)

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Solutions

67 The diagram shows a solid cube placed on a horizontal floor.



The cube has a mass of 60 kg.

(a) Work out the density of the cube.

..... kg/m^3

(3)

The force exerted by the cube on the floor is equal to 600 newtons.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

(b) Calculate the pressure on the floor due to the cube in newtons/m^2

..... newtons/m^2

(3)

(Total for Question 67 is 6 marks)

68 Write 8.1 m^2 in cm^2

..... cm^2

(Total for Question 68 is 1 mark)

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69 (a) Solve $\frac{x}{2} + 3 = 8$

$x =$ .....

(2)

(b) Solve $\frac{y-4}{5} = 10$

$y =$ .....

(2)

(Total for Question 69 is 4 marks)

70 Some of the ingredients needed to make 12 pancakes are shown below.

For 12 pancakes	
Flour	300 g
Milk	400 ml
Eggs	2

Work out how much of each ingredient is needed to make 30 pancakes.

..... g of flour

..... ml of milk

..... eggs

(Total for Question 70 is 3 marks)

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71 A bag contains only red, green and blue counters.

$$\begin{matrix}\text{number of}\\\text{red counters}\end{matrix} : \begin{matrix}\text{number of}\\\text{green counters}\end{matrix} : \begin{matrix}\text{number of}\\\text{blue counters}\end{matrix} = 3 : 5 : 4$$

The bag contains 36 blue counters.
Work out how many counters are in the bag in total.

.....

(Total for Question 71 is 3 marks)

72 A shop sells two jars of jam.

Small	Large
£0.65	£1.20
250 g of jam	450 g of jam





Which size of jam represents the best value for money?
Show clearly how you got your answer.

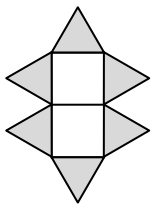
.....

(Total for Question 72 is 3 marks)

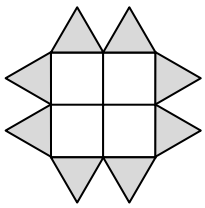
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Solutions

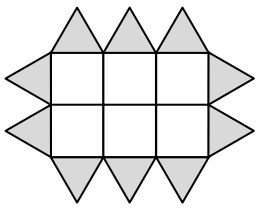
73 Here is a sequence of patterns made from square tiles ☐ and triangular tiles. △



pattern number 1



pattern number 2



pattern number 3

(a) Find an expression, in terms of n, for the number of triangular tiles in pattern n.

.....

(2)

Rich makes one of the patterns from the sequence.
He uses 88 total tiles.

(b) Work out how many **square** tiles Rich used.

..... square tiles

(3)

(Total for Question 73 is 5 marks)

74 Peter and Wendy both run a 400 metre race.
Peter runs at an average speed of 8 m/s and Wendy runs at an average speed of 6.25 m/s
Peter wins the race.

After Peter finishes, how many more seconds will pass before Wendy finishes?

..... seconds

(Total for Question 74 is 3 marks)

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75 The table shows information about the number of goals scored by a football team in 19 matches.

Goals	Frequency
0	2
1	6
2	4
3	4
4	3

(a) Write down the modal number of goals scored for the 19 matches.

..... goals

(1)

(b) Work out the median number of goals scored for the 19 matches.

..... goals

(1)

(c) Work out the mean number of goals scored for the 19 matches.

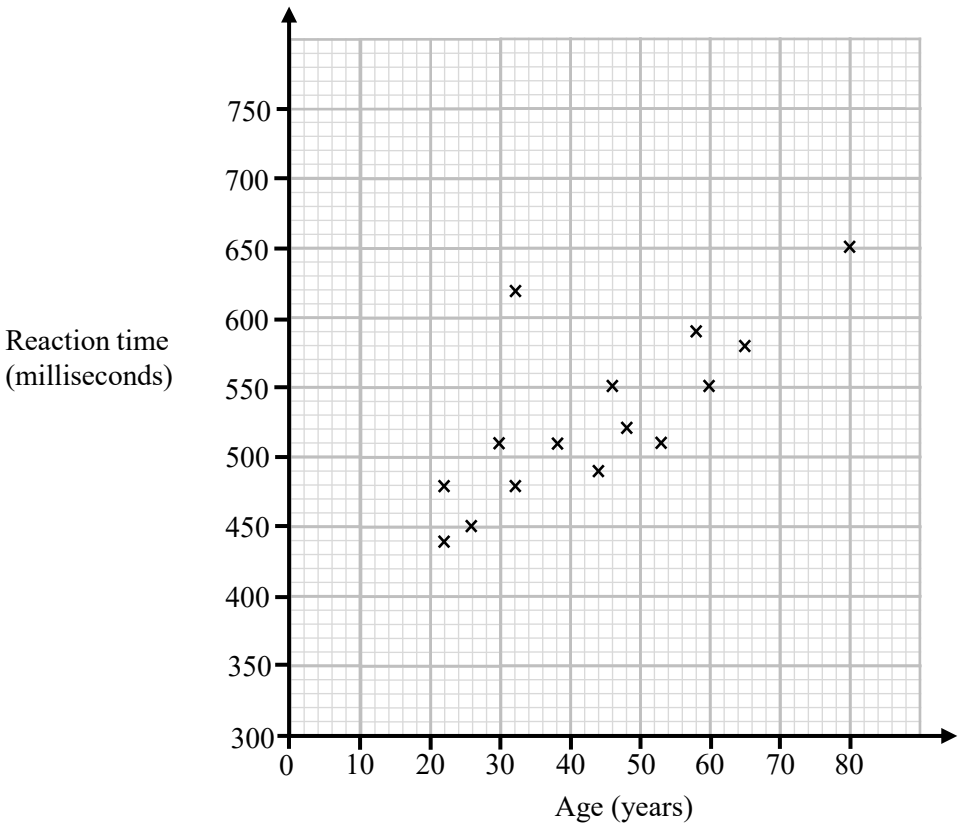
..... goals

(3)

(Total for Question 75 is 5 marks)

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76 The scatter graph shows reaction times in milliseconds and the ages of 15 people.



(a) One of the points plotted on the scatter graph is considered an outlier.
Write down the coordinates of this point.

(..... , ...)

(1)

(b) For all the other points write down the type of correlation.

.....

(1)

A person aged 55 has their reaction time measured.

(c) Use the graph to estimate their reaction time.

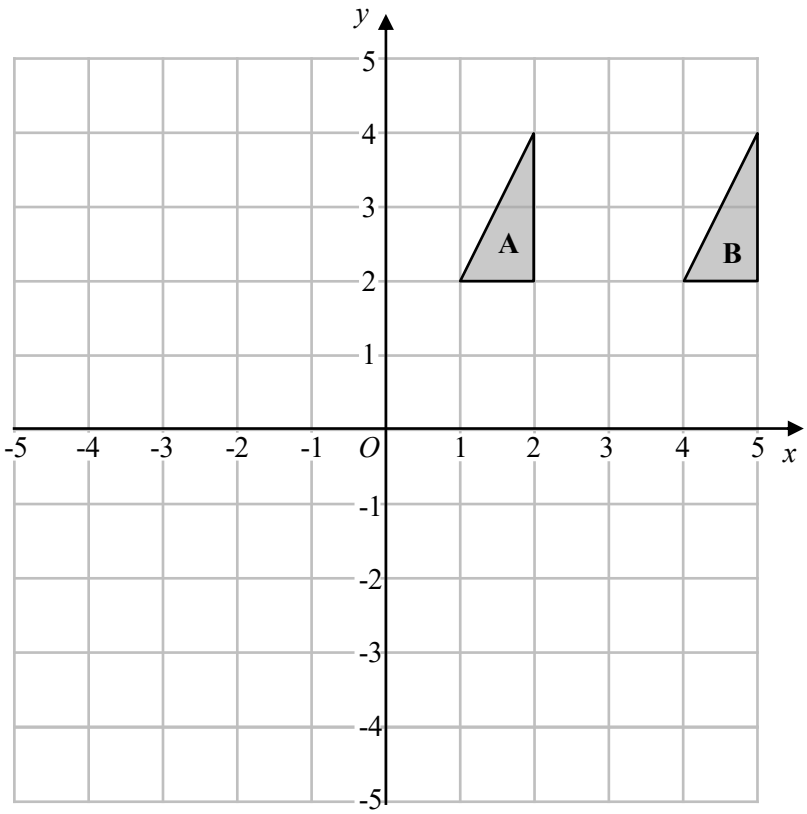
..... milliseconds

(2)

(Total for Question 76 is 4 marks)

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77



(a) Describe fully the single transformation that maps triangle **A** onto triangle **B**

.....

.....

(2)

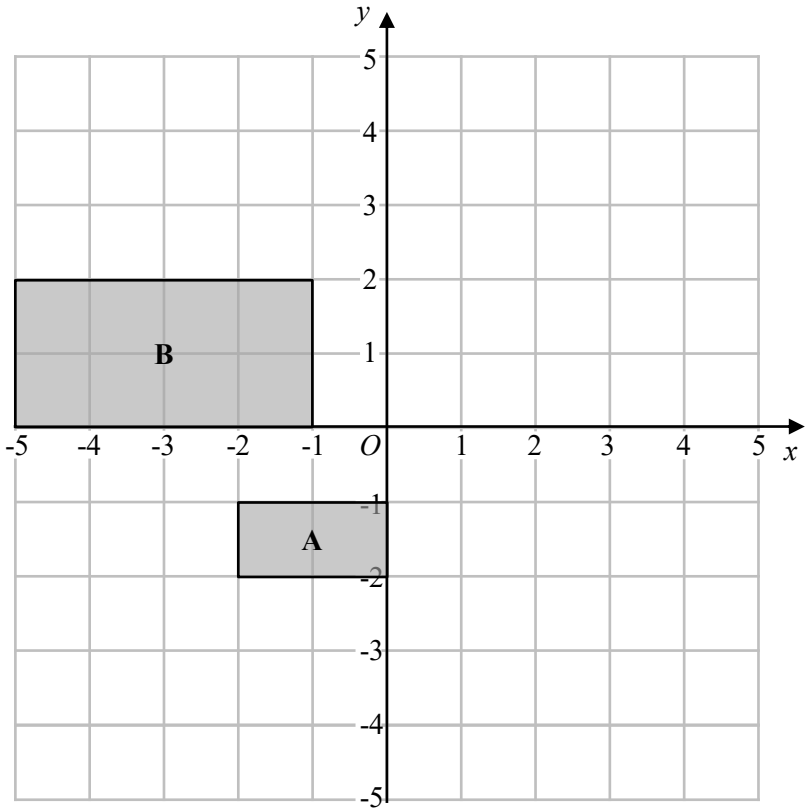
(b) Rotate triangle **A,** 90° anticlockwise about the point (1,0)
Label the new triangle **C**.

(2)

(Total for Question 77 is 4 marks)

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78



(a) Describe fully the single transformation that maps rectangle **A** onto rectangle **B**

.....

.....

(3)

(b) Reflect rectangle **A** in the line $y = 1$
Label the new rectangle **C**.

(2)

(Total for Question 78 is 5 marks)

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79 The table shows information about the heights of students in Year 7 and Year 11.

	Mean	Range
Year 7	144 cm	25 cm
Year 11	173 cm	40 cm

Compare the distribution of the heights of Year 7 students with the distribution of the heights of Year 11 students.

.....

.....

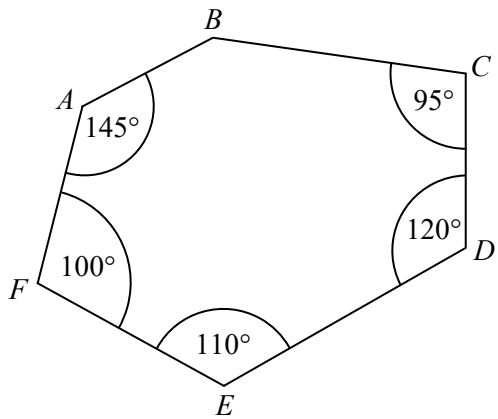
.....

.....

.....

(Total for Question 79 is 2 marks)

80 *ABCDEF* is a hexagon.



Work out the size of angle *ABC*.

°

.....

(Total for Question 80 is 4 marks)

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Solutions

81 (a) Find the highest common factor (HCF) of 75 and 210

.....

(2)

(b) Find the lowest common multiple (LCM) of 75 and 210

.....

(2)

(Total for Question 81 is 4 marks)

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82 Harry practices his penalty kicks on three different days and records how many he scores and misses.

The table below shows how many times he scored and missed on each day.

	Monday	**Tuesday**	**Wednesday**
Score	19	35	27
Miss	11	25	18

Harry's coach wants to estimate the probability that he will score a penalty.

(a) Which day's results will give the best estimate for the probability that Harry will score a penalty? Give a reason for your answer.

.....

.....

(1)

Ella knows that the probability that she will score a penalty is 0.7
During one week Ella takes 200 penalties.

(b) Work out an estimate for the number of penalties that Ella scored.

.....

(2)

(Total for Question 82 is 3 marks)

83 Show that $4\frac{1}{2} \div 1\frac{3}{4} = 2\frac{4}{7}$



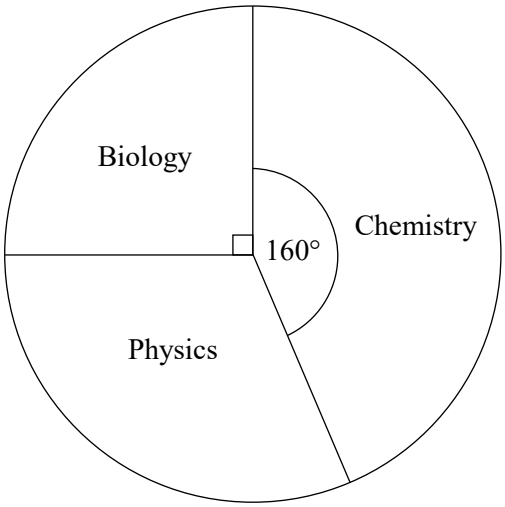
(Total for Question 83 is 3 marks)

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Solutions

84 Craig is revising for his science exams.

The pie chart below shows how much time he spends revising each of the subjects.



Craig spends 96 minutes revising for Chemistry.

Work out how many minutes Craig spends revising for Physics.

..... minutes

(Total for Question 84 is 3 marks)

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85 A floor with an area of 10 m^2 can be tiled by 3 workers in 8 hours.
Work out how long it would take 4 workers to tile a floor that is 25 m^2
Assume that all workers can tile at the same rate.

..... hours

(Total for Question 85 is 3 marks)

86 Conor invests £500 in a bank for 3 years at 4% interest.

(a) Work out how much money Conor would have in his account after 3 years using **simple** interest.

£.....

(2)

(b) Work out how much money Conor would have in his account after 3 years using **compound** interest

£.....

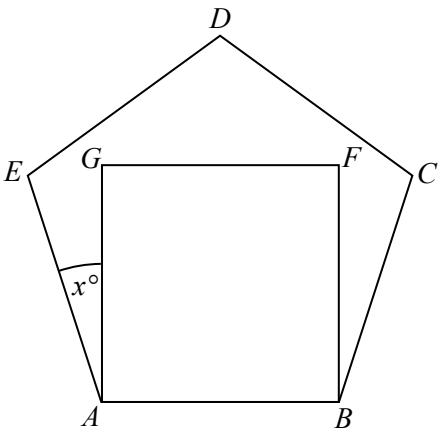
(2)

(Total for Question 86 is 4 marks)

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Solutions

87 *ABCDE* is a regular pentagon and *ABFG* is a square.



Angle $EAG = x°$

Work out the value of x

$x =$ .....

(Total for Question 87 is 3 marks)

88 (a) Find the reciprocal of 1.25
Give your answer as a decimal.

.....

(1)

(b) A number, n, is rounded to 1 decimal place.
The result is 6.4

Complete the error interval for n.

..... $\leq n <$ .....

(2)

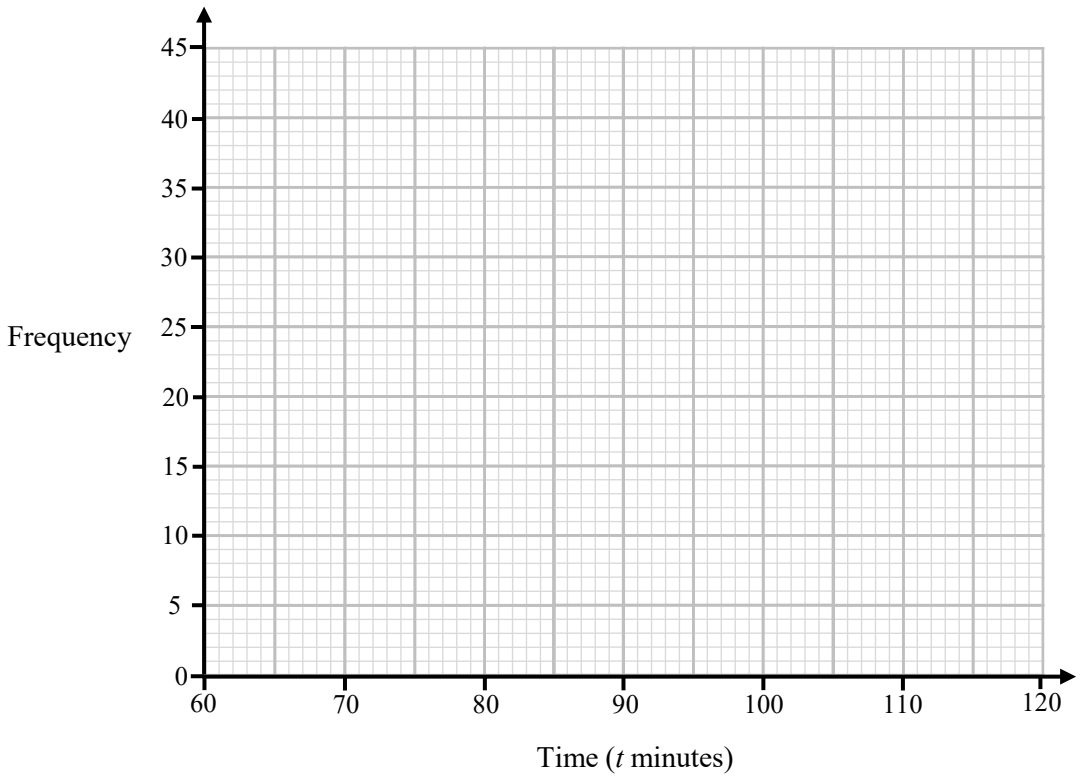
(Total for Question 88 is 3 marks)

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89 The table shows information about the time, t minutes, that 100 people took to complete a race.

Time (t minutes)	Frequency
$60 < t \leq 70$	3
$70 < t \leq 80$	12
$80 < t \leq 90$	15
$90 < t \leq 100$	44
$100 < t \leq 110$	26

On the grid, draw a frequency polygon for the information in the table.



(Total for Question 89 is 2 marks)

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Solutions

90 The table shows information about the time, t minutes, that 60 students spent revising.

Time (t minutes)	Frequency
$10 < t \leq 20$	28
$20 < t \leq 30$	13
$30 < t \leq 40$	13
$40 < t \leq 50$	6

(a) Write down the modal class.

.....

(1)

(b) Write down the interval containing the median.

.....

(1)

(c) Work out an estimate for the mean time spent revising.

..... minutes

(3)

(Total for Question 90 is 5 marks)

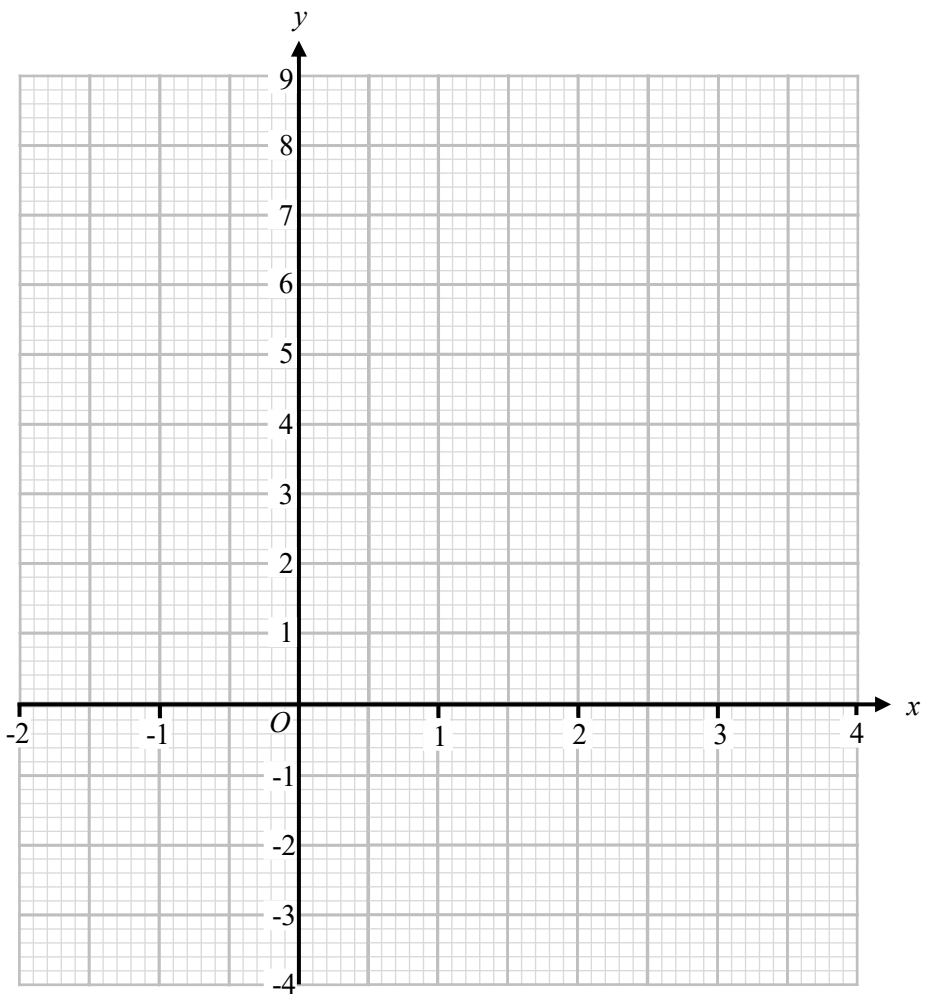
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91 (a) Complete the table of values for $y = x^2 - 3x - 1$

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

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x - 1$ for values of x from -2 to 4



(2)

(c) Use the graph to estimate the solutions to $x^2 - 3x - 1 = 0$

.....

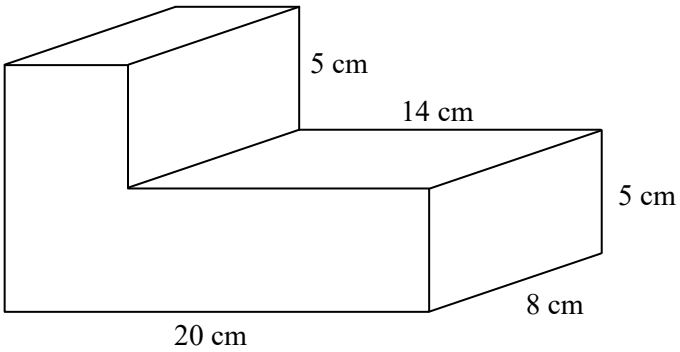
(2)

(Total for Question 91 is 6 marks)

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Solutions

92



Work out the volume of the prism.

..... cm^3

(Total for Question 92 is 4 marks)

93 The interior angle of a regular polygon is 168°

(a) Work out the exterior angle for the regular polygon

°

.....

(1)

(b) Work out how many sides the regular polygon has.

.....

(2)

(Total for Question 93 is 3 marks)

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Solutions

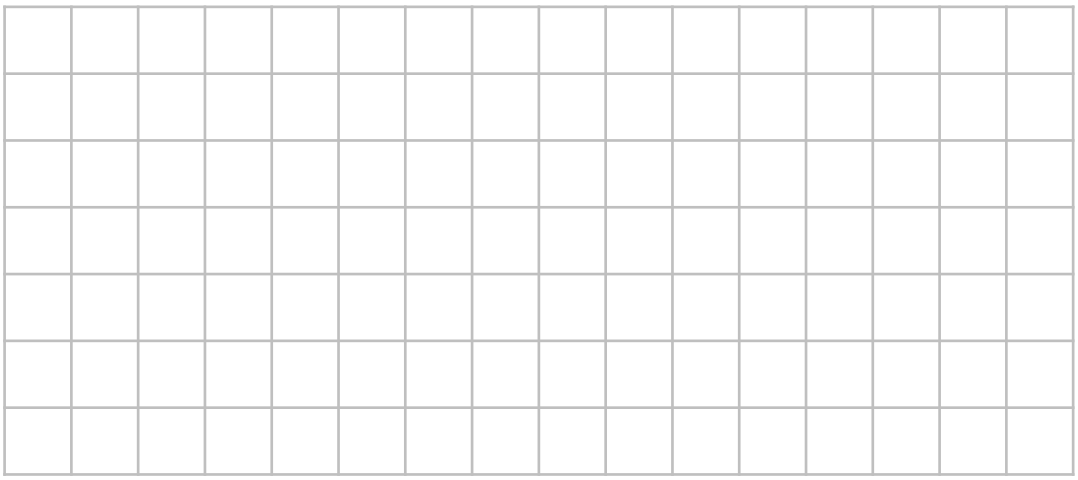
94 Here are two column vectors $\mathbf{a} = \begin{pmatrix} -6 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$

(a) Work out $2\mathbf{a} - \mathbf{b}$ as a column vector.

$\begin{pmatrix} \ldots\ldots \\ \ldots\ldots \end{pmatrix}$

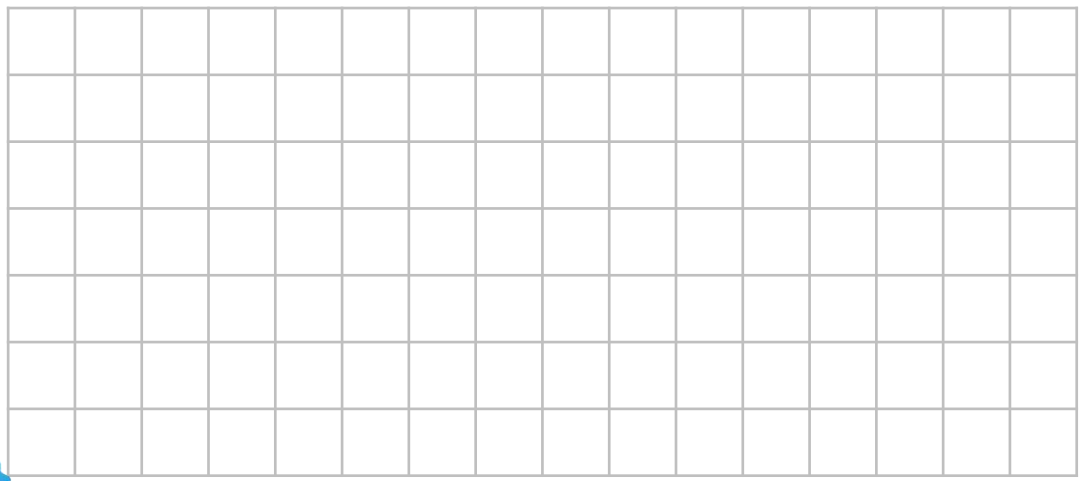
(2)

(b) On the grid below draw and label the vector **a**



(1)

(c) On the grid below draw and label the vector **2b**



(1)

(Total for Question 94 is 4 marks)

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95 (a) Write 7.11×10^{-3} as an ordinary number.



.....

(1)

(b) Work out $(8 \times 10^{10}) \times (3 \times 10^{3})$
Give your answer in standard form.

.....

(2)

(Total for Question 95 is 3 marks)

96 (a) Expand and simplify $(x + 3)(x + 2)$

.....

(2)

(b) Factorise $x^2 - 11x + 24$

.....

(2)

(c) Solve $x^2 + 2x - 8 = 0$

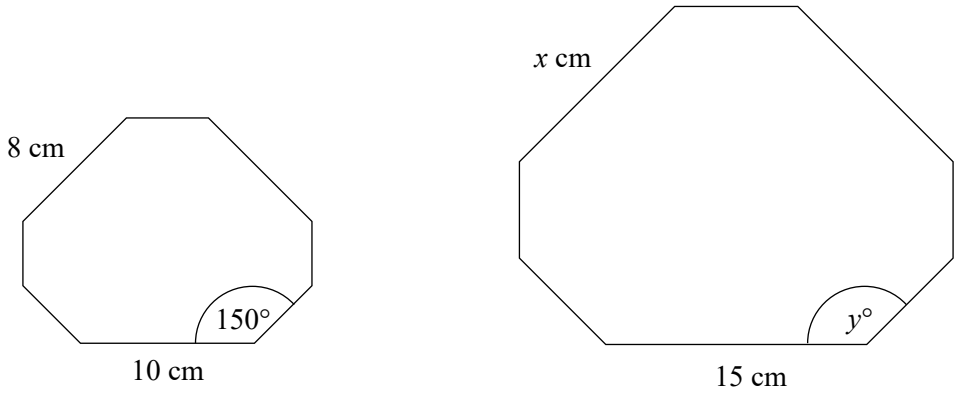
.....

(3)

(Total for Question 96 is 7 marks)

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97 Below are two similar octagons.



(a) Work out the value of x.

$x =$ .....

(2)

(b) Work out the value of y.

$y =$ .....

(1)

(Total for Question 97 is 3 marks)

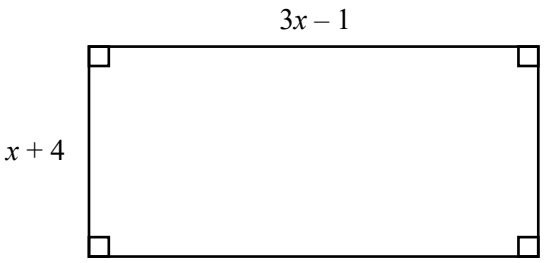
98 Make b the subject of the formula $r = 9b - p$

.....

(Total for Question 98 is 2 marks)

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99 Here is a rectangle with a perimeter of 70 cm



(a) Show that $8x + 6 = 70$

(2)

(b) Find the value of x

$x =$ .....

(2)

(Total for Question 99 is 4 marks)

100 Solve $7x + 10 = 3x - 14$

$x =$ .....

(Total for Question 100 is 3 marks)

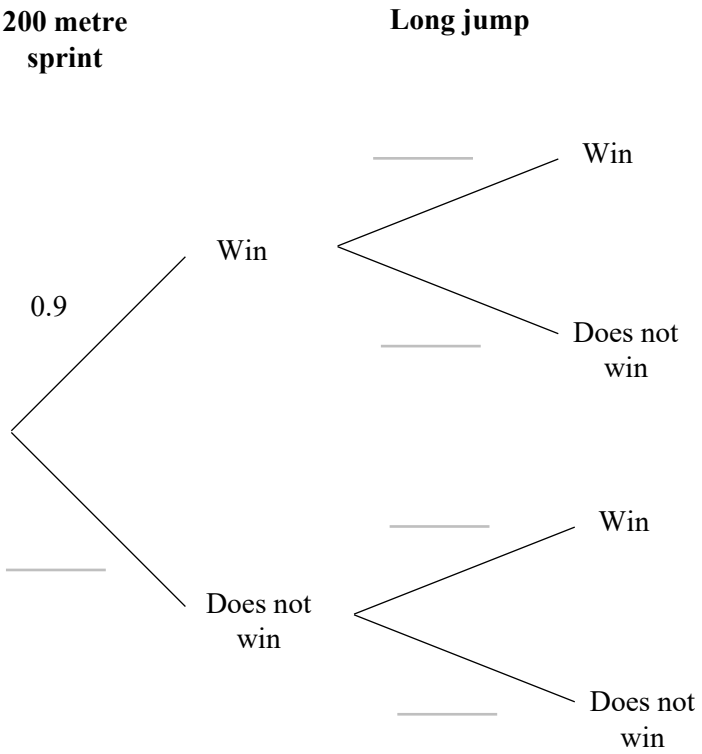
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101 Katarina competes in both the 200 metre sprint and the long jump at her school sports day.

The probability that she will win the 200 metre sprint is 0.9

The probability that she will win the long jump is 0.8

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Katarina wins exactly one of the events.

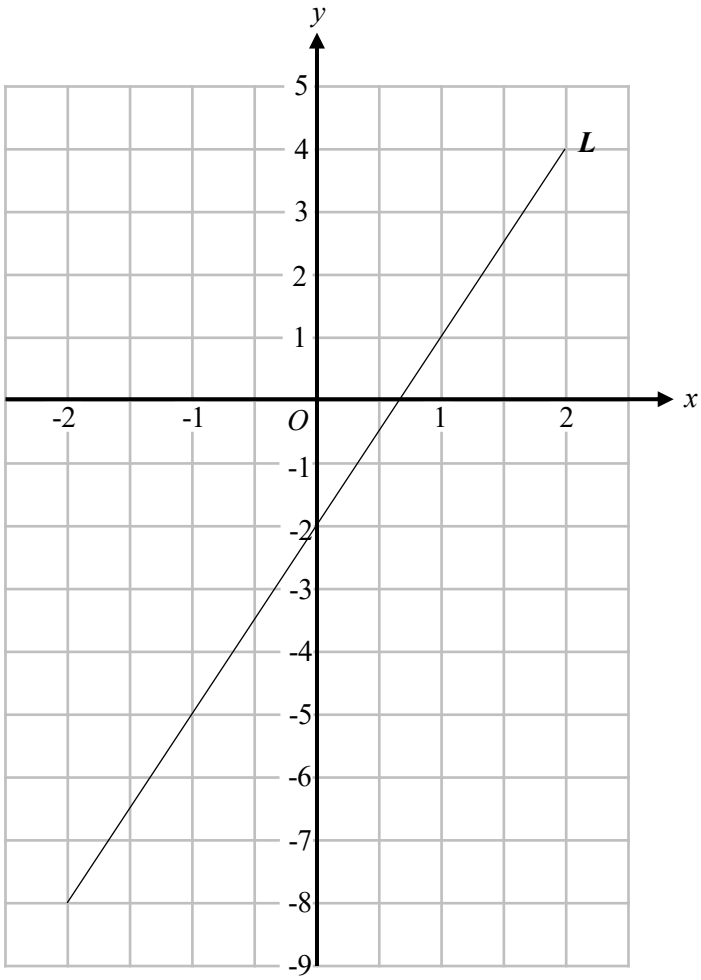
.....

(3)

(Total for Question 101 is 5 marks)

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102 Below is a graph of the line ***L***.



(a) Write down the coordinates of the *y*-intercept of the line ***L***.

(..... , ...)

(1)

(b) Work out the gradient of the line ***L***.

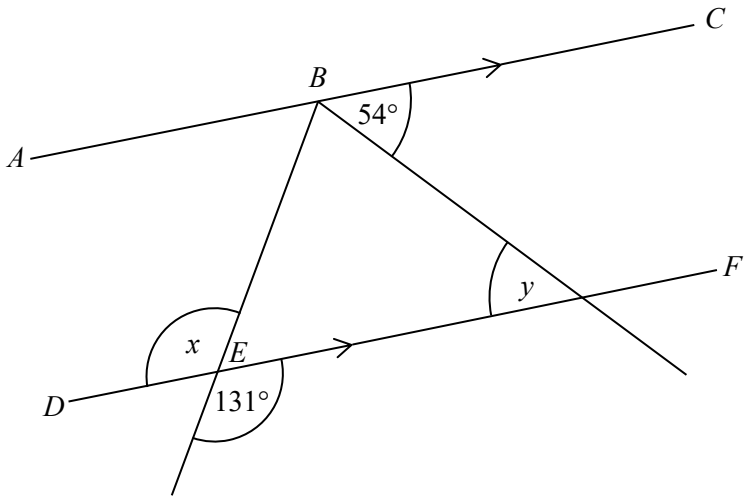
.....

(2)

(Total for Question 102 is 3 marks)

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103



ABC and *DEF* are parallel lines.

(a) Write down the value of x.

.....°

(1)

(b) Write down the value of y.

.....°

(1)

(c) Give a reason to your answer for part (b).

.....

.....

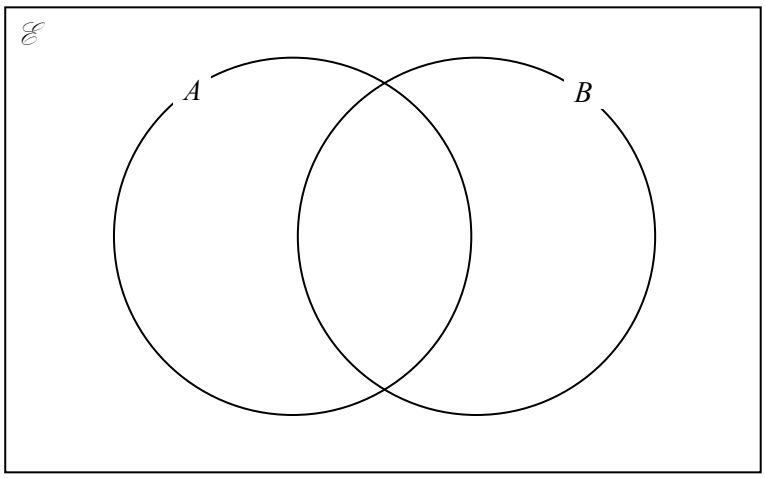
(1)

(Total for Question 103 is 3 marks)

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104 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{multiples of } 3\}$
$B = \{\text{factors of } 12\}$

(a) Complete the Venn diagram for this information.



(3)

A number is chosen at random from the universal set, $\mathscr{E}$

(b) Find the probability that this number is in the set A ∪ B

.....

(2)

(Total for Question 104 is 5 marks)

105 (a) Write down the exact value of cos60°

.....

(1)

(b) Write down the exact value of sin45°

.....

(1)

(Total for Question 105 is 2 marks)

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106 *ABCD* is a map of a rectangular field.



1 cm represents 50 metres.

A tower needs to be placed in the field so that it is

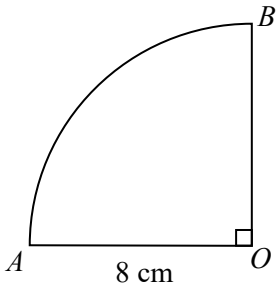
Closer to point *C* than to point *D*.
Within 350 metres of point *B*.

Shade the region of possible positions for the tower.

(Total for Question 106 is 3 marks)

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107 The diagram shows a sector of a circle of radius 8 cm.



Angle $AOB = 90°$

(a) Work out the area of the sector.
Give your answer to 1 decimal place.

..... cm^2
(2)

(b) Work out the perimeter of the sector.
Give your answer to 1 decimal place.

.....cm
(3)

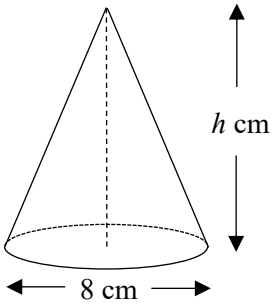
(Total for Question 107 is 5 marks)

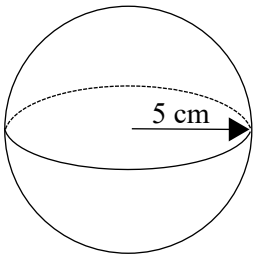
108 Simplify $(2y^4)^3$

.....
(Total for Question 108 is 2 marks)

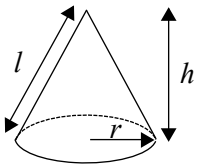
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109 Below are a solid cone and a solid sphere.

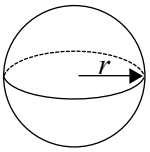




Volume of a cone $= \frac{1}{3}\pi r^2 h$



Volume of a Sphere $= \frac{4}{3}\pi r^3$



Volume of the cone = 30% of the volume of the sphere.

Work out h, the height of the cone.
Give your answer to 1 decimal place.

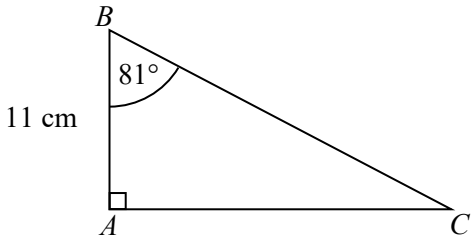
..... cm

(Total for Question 109 is 5 marks)

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110



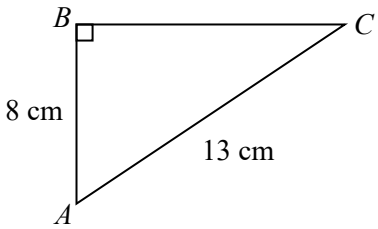
Triangle ABC is a right-angled triangle.
Angle $ABC = 81°$
$AB = 11$ cm

Work out the length of AC.
Give your answer to 1 decimal place.

..... cm

(Total for Question 110 is 2 marks)

111



Triangle ABC is a right-angled triangle.
$AB = 8$ cm
$AC = 13$ cm

Work out the size of angle CAB.
Give your answer to 1 decimal place.

°

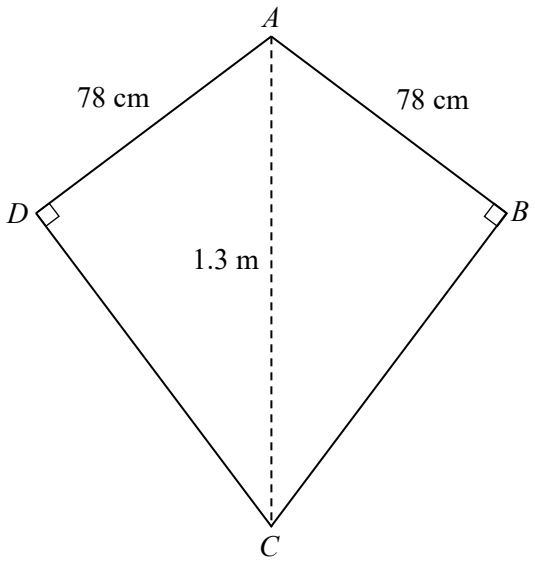
.....

(Total for Question 111 is 2 marks)

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112 $ABCD$ is a kite.



$AB = AD = 78$ cm
$AC = 1.3$ m
Angle ADC = Angle $ABC = 90°$

Work out the perimeter of the kite.
Give your answer in centimetres.

..... cm

(Total for Question 112 is 4 marks)

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113 Solve the simultaneous equations

$$5x + 4y = 41$$
$$3x - 2y = 29$$

$x =$ .....

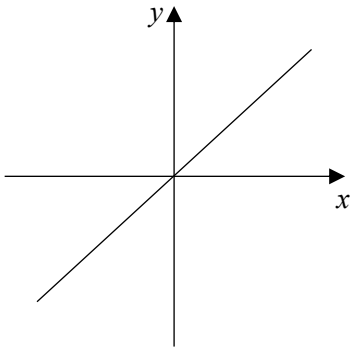
$y =$ .....

(Total for Question 113 is 3 marks)

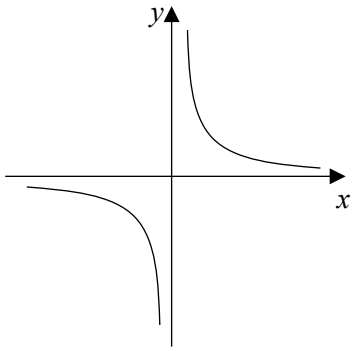
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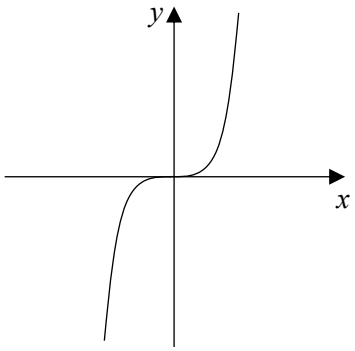
114 Here are some graphs



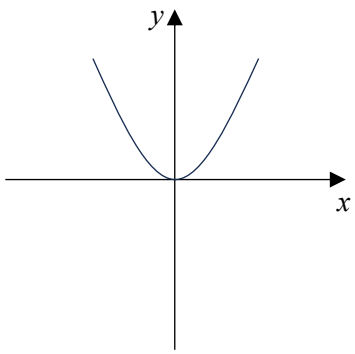
Graph A



Graph B



Graph C



Graph D

In the table below, match each equation with the letter of its graph

Equation	Graph
$y = x$	
$y = x^2$	
$y = x^3$	
$y = \frac{1}{x}$	

(Total for Question 114 is 3 marks)

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