

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write 6819 to the nearest 1000

7000

(Total for Question 1 is 1 mark)

- 2 Write these temperatures in order.
Start with the lowest temperature.

7°C -2°C 10°C -5°C 3°C

$-5^{\circ}\text{C}, -2^{\circ}\text{C}, 3^{\circ}\text{C}, 7^{\circ}\text{C}, 10^{\circ}\text{C}$

(Total for Question 2 is 1 mark)

- 3 Write 0.075 as a fraction.
Give your fraction in its simplest form.

$\frac{3}{40}$

(Total for Question 3 is 2 marks)

- 4 Find the value of 5^4

625

(Total for Question 4 is 1 mark)

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5

Living to 100 years old

1 in 3 babies born last year
are expected to live
to 100 years old

720 000 babies were born last year.

How many of these babies are expected to live to 100 years old?

$$720\,000 \div 3 = 240\,000$$

240 000

(Total for Question 5 is 2 marks)

- 6 Here is part of a train timetable from Swindon to London.

Swindon to London							
Swindon	06 10	06 27	06 41	06 58	07 01	07 17	07 28
Didcot	06 27	06 45	06 58	–	07 18	–	07 45
Reading	06 41	06 59	07 13	07 28	07 33	07 43	08 00
London	07 16	07 32	07 44	08 02	08 07	08 14	08 33

- (a) How long should the 06 58 train from Swindon take to get to London?

1hr 4 mins
(1)

Clare says,

“All these trains take more than one hour to get from Swindon to London.”

- (b) Is Clare correct?

You must give a reason for your answer.

No the 07:17 train takes 57 mins to
get to London.

(1)

(Total for Question 6 is 2 marks)

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7 Tracy buys

2 coffees at	£1.10	each
3 teas at	95p	each
5 sandwiches at	£2.15	each

Tracy shares the total cost equally between 5 people.

How much does each person pay?

$$2 \times 1.1 = 2.2$$

$$3 \times 0.95 = 2.85$$

$$5 \times 2.15 = 10.75$$

$$\underline{\hspace{1cm}} \\ 15.8$$

$$15.8 \div 5 = 3.16$$

£ 3.16

(Total for Question 7 is 4 marks)

- 8 Rachel carried out a survey of 10 people to find out the type of fruit they like best.

The table gives information about her results.

Type of fruit	Number of people
apple	2
banana	5
orange	3

- (a) Which type of fruit is the mode?

banana

(1)

In Rachel's survey, 2 out of 10 people like apples best.

- (b) Write 2 out of 10 as a percentage.

20

%

(1)

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Pete also carried out a survey to find out the type of fruit people like best. He asked 30 people which type of fruit they like best.

He drew this pie chart for his results.

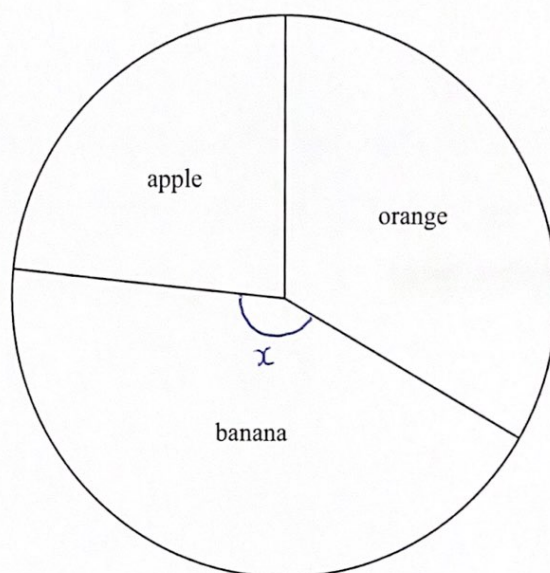


Diagram
accurately drawn

A smaller proportion of people like bananas best in Pete's survey than in Rachel's survey.

(c) Explain how Pete's pie chart and Rachel's table show this.

Rachel's table shows $\frac{1}{2}$ of people like bananas the best, whereas Pete's pie chart shows less than
more half like bananas the best as the angle, x ,
is less than $\frac{360}{2} = 180$. (2)

(Total for Question 8 is 4 marks)

- 9 The smallest angle of a triangle is 25°
The triangle is enlarged by scale factor 3

Ben says,

"The smallest angle of the enlarged triangle is 75° because $25 \times 3 = 75$ "

Is Ben right?

Explain your answer.

No, the angle will still be 25° as the
ratio of sides will still be the same.

(Total for Question 9 is 1 mark)

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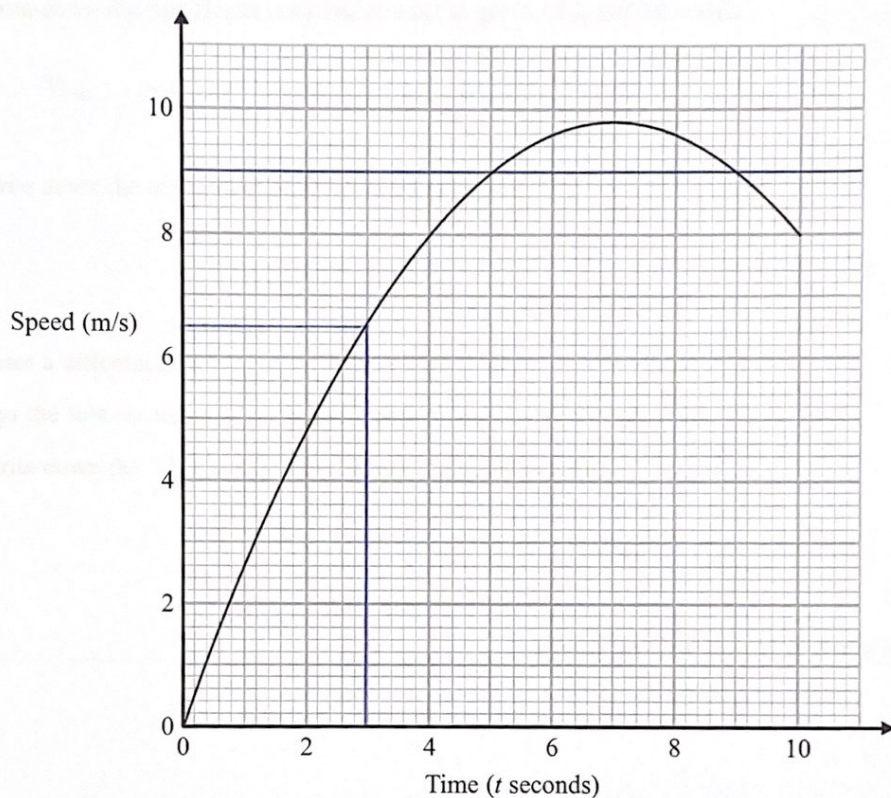
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10 Karol ran in a race.

The graph shows her speed, in metres per second, t seconds after the start of the race.



(a) Write down Karol's speed 3 seconds after the start of the race.

6.5 m/s
(1)

(b) Write down Karol's greatest speed.

9.8 m/s
(1)

There were two times when Karol's speed was 9 m/s.

(c) Write down these two times.

5 seconds
9 seconds
(1)

(Total for Question 10 is 3 marks)

- 11 The first three terms of a number pattern are 1 2 4

Hester says the first five terms of this number pattern are 1 2 4 8 16

- (a) Write down the rule Hester could have used to get the 4th and 5th terms.

The number doubles each time

(1)

- (b) Write down the 6th term of Hester's number pattern.

32

(1)

Jack uses a different rule.

He says the first six terms of the number pattern are 1 2 4 7 11 16

1 2 3 4 5

- (c) Write down the 7th and 8th terms of Jack's number pattern.

22

29

(1)

(Total for Question 11 is 3 marks)

- 12 Martin has 8 pints of soup in a pan.
He also has 24 soup bowls.
He puts 0.3 pints of soup into each bowl.

How much soup has Martin left over?

$$\begin{array}{r} 8 \\ 0.3 \end{array} = \frac{80}{3}$$

$$24 \times 0.3 = 7.2$$

$$8 - 7.2 = 0.8$$

$$\frac{80}{3} - 24 = \frac{8}{3}$$

0.8 pints

(Total for Question 12 is 3 marks)

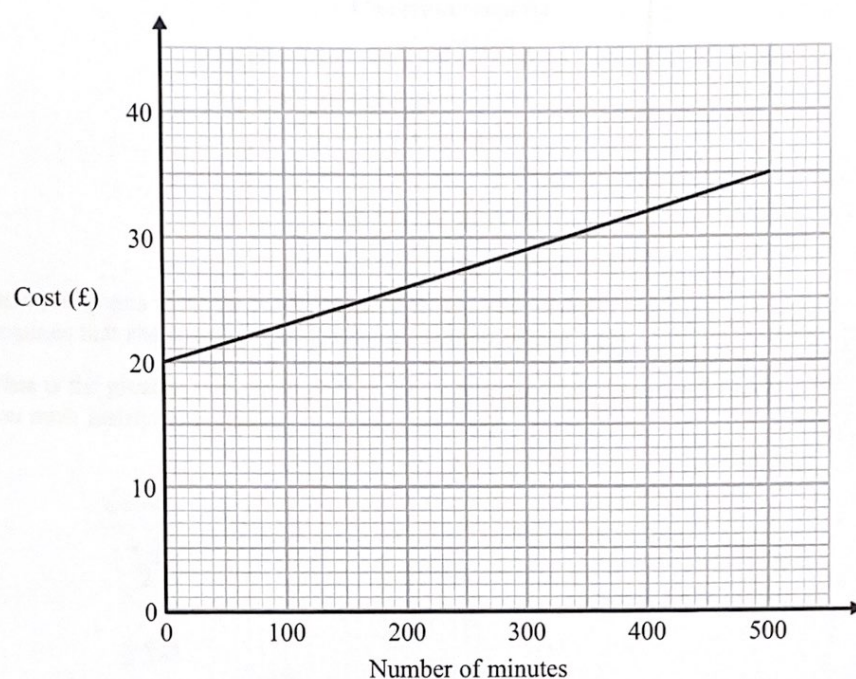
- 13 Abi invests £500 for 4 years in a bank account.
The account pays simple interest at a rate of 2.3% per year.
Work out the total amount of interest Abi has got at the end of 4 years.

$$(500 \times 0.023) \times 4 = 46$$

£ 46

(Total for Question 13 is 3 marks)

- 14 The graph shows the cost of using a mobile phone for one month for different numbers of minutes of calls made.



The cost includes a fixed rental charge of £20 and a charge for each minute of calls made.
Work out the charge for each minute of calls made.

$$\frac{15}{500} = 0.03$$

3p

(Total for Question 14 is 2 marks)

- 15 Here is a list of ingredients for making chocolate mousse for 2 people.

**Chocolate mousse
for 2 people**

40 grams sugar
110 grams dark chocolate
2 eggs
 $\frac{1}{4}$ teaspoon lemon juice

Ellie has 250 grams of sugar and 550 grams of dark chocolate.
She assumes that she has plenty of lemon juice and plenty of eggs.

- (a) What is the greatest number of people Ellie can make chocolate mousse for?
You must justify your answer.

$$\frac{250}{\frac{40}{2}} = 12.5$$

$$\frac{550}{\frac{110}{2}} = 10$$

10 people

(3)

Ellie only has 6 eggs.

- (b) What effect would this have on the greatest number of people Ellie can make chocolate mousse for?

$(6 \div 2) \times 2 = 6$, she can only make
mousse for 6 people.

(1)

(Total for Question 15 is 4 marks)

- 16 A sprinter runs a distance of 200 metres in 25 seconds.

Work out the average speed of the sprinter.

$$\frac{200}{25} = 8$$

8 m/s

(Total for Question 16 is 1 mark)

- 17 (a) Simplify $7x + 2y - 3x + 4y$

$$4x + 6y$$

(2)

- (b) Factorise $10x - 15$

$$5(2x - 3)$$

(1)

- (c) Solve $5p = 3p + 8$

$$2p = 8$$

$$p = 4$$

$$p = 4$$

(2)

(Total for Question 17 is 5 marks)

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- 18 There are 64 cards in a pack.
Each card is either red or black.
The ratio of the number of red cards to the number of black cards is 1 : 1

8 red cards are removed from the pack.

Find the ratio of the number of red cards now in the pack to the number of black cards now in the pack.

Give your answer in its simplest form.

$$64 \div 2 = 32$$

32 red, 32 black

→ 24 red, 32 black

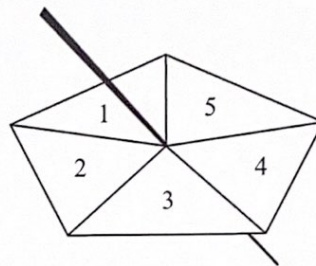
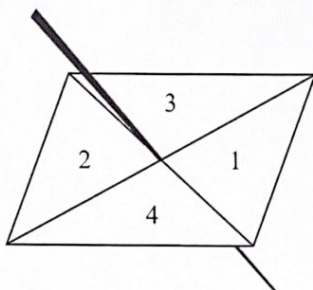
$$\text{ratio} = 24 : 32 = 3 : 4$$

3 : 4

(Total for Question 18 is 3 marks)

19 Here are a 4-sided spinner and a 5-sided spinner.

The spinners are fair.



Jeff is going to spin each spinner once.

Each spinner will land on a number.

Jeff will get his score by adding these two numbers together.

(a) Complete the possibility space diagram for each possible score.

		5-sided spinner				
		1	2	3	4	5
4-sided spinner	1	2	3	4	5	6
	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9

(1)

Jeff spins each spinner once.

(b) Find the probability that Jeff gets

(i) a score of 3

$$\frac{2}{20} = \frac{1}{10}$$

$$\frac{1}{10}$$

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(ii) a score of 5 or more.

$$\frac{14}{20} = \frac{7}{10}$$

$$\frac{7}{10}$$

(2)

(Total for Question 19 is 3 marks)

20 Water flows through a pipe at a rate of 20 gallons per minute.

1 gallon = 4.55 litres.

Change 20 gallons per minute to litres per second.
Give your answer correct to 3 significant figures.

$$20 \times 4.55 = 91$$

$$91 \div 60 = 1.52$$

$$1.52$$

litres per second

(Total for Question 20 is 2 marks)

21 Find the highest common factor (HCF) of 32, 48 and 72

factors of 32 = 32, 16, 8, 4, 2, 1

$$\frac{72}{32} = \frac{9}{4}$$

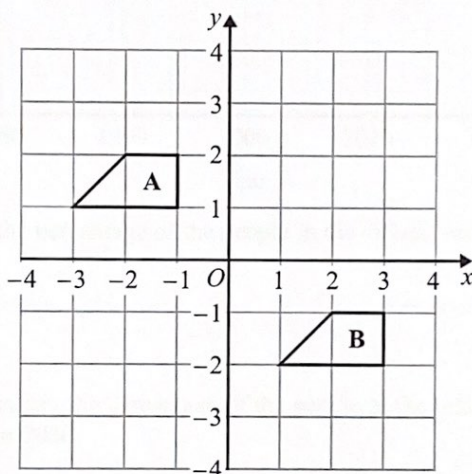
$$\frac{72}{16} = \frac{9}{2}$$

$$72/8 = 9$$

8

(Total for Question 21 is 2 marks)

22

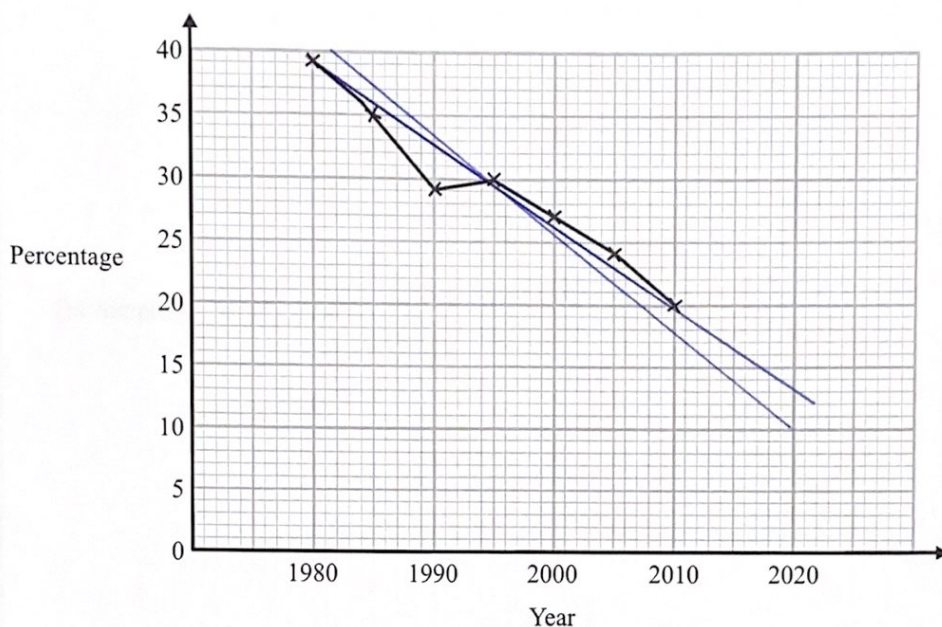


Describe the single transformation that maps shape A onto shape B.

Translation by $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

(Total for Question 22 is 2 marks)

- 23 The time series graph shows information about the percentages of the people in a village that used the village shop for the years between 1980 and 2010



- (a) Describe the trend in the percentage of the people in the village who used the shop for this period.

Percentage of people who use the Shop decreases.

(1)

- (b) (i) Use the graph to predict the percentage of the people in the village likely to use the shop in the year 2020

13 %

- (ii) Is your prediction reliable?
Explain your answer.

NO, because 2020 is outside the range of the data.

(3)

(Total for Question 23 is 4 marks)

24 (a) Expand and simplify $3(y - 2) + 5(2y + 1)$

$$3y - 6 + 10y + 5 = 13y - 1$$

$$13y - 1$$

(2)

(b) Simplify $5u^2w^4 \times 7uw^3$

$$35u^3w^7$$

$$35u^3w^7$$

(2)

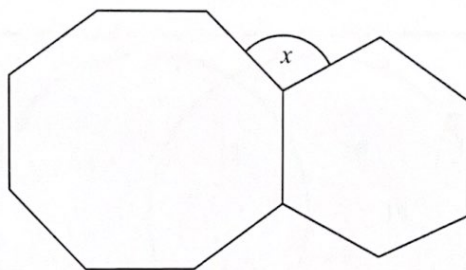
(Total for Question 24 is 4 marks)

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The diagram shows a regular octagon and a regular hexagon.

Find the size of the angle marked x .

You must show all your working.

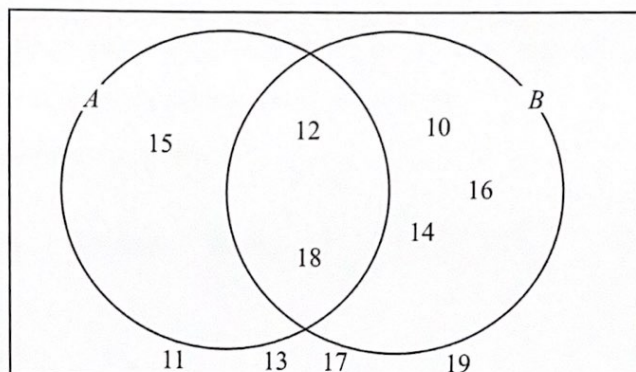
$$\begin{aligned} \text{exterior angles of a octagon} &= 360 \div 8 = 45 \\ \text{exterior angles of a hexagon} &= 360 \div 6 = 60 \end{aligned}$$

$$60 + 45 = 105$$

$$x = 105^\circ$$

(Total for Question 25 is 3 marks)

26 Here is a Venn diagram.



(a) Write down the numbers that are in set

(i) $A \cup B$

10, 12, 14, 15, 16, 18

(ii) $A \cap B$

12, 18

(2)

One of the numbers in the diagram is chosen at random.

(b) Find the probability that the number is in set A'

$$\text{Set } A = \{15, 12, 18\}$$

$$P(A') = \frac{10-3}{10} = \frac{7}{10}$$

$\frac{7}{10}$

(2)

(Total for Question 26 is 4 marks)

27 On a farm

the number of cows and the number of sheep are in the ratio 6 : 5
the number of sheep and the number of pigs are in the ratio 2 : 1

The total number of cows, sheep and pigs on the farm is 189

How many sheep are there on the farm?

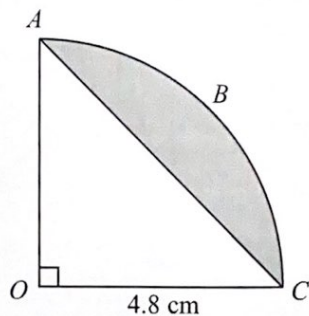
$$\text{cows : sheep : pig} = 12 : 10 : 5$$

$$\frac{189}{27} = 7$$

$$7 \times 10 = 70$$

70

(Total for Question 27 is 3 marks)



The arc ABC is a quarter of a circle with centre O and radius 4.8 cm.
 AC is a chord of the circle.

Work out the area of the shaded segment.
 Give your answer correct to 3 significant figures.

$$\begin{aligned} \text{Area of } \frac{1}{4} \text{ circle} &= \frac{1}{4} \times \pi \times 4.8^2 = 5.76\pi \end{aligned}$$

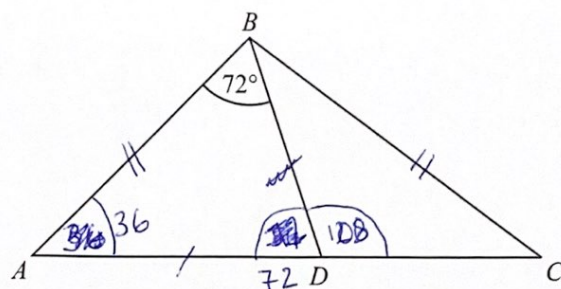
$$\text{Area of triangle} = \frac{1}{2} \times 4.8^2 = 11.52$$

$$5.76\pi - 11.52 = 6.58$$

6.58

cm²

(Total for Question 28 is 3 marks)



ABC is an isosceles triangle with $BA = BC$.

D lies on AC .

ABD is an isosceles triangle with $AB = AD$.

Angle $ABD = 72^\circ$

Show that the triangle BCD is isosceles.

You must give a reason for each stage of your working.

$$180 - (72 \times 2) = 54^\circ = \angle BAD = \angle BDA$$

$$\angle BDC = 180 - 54 = 126$$

$\angle BDA = 72^\circ$ (base of an isosceles Δ)

$$180 - (2 \times 72) = 36 = \angle BAD$$

$\angle BCA = 36^\circ$ (base of an isosceles Δ)

$$\angle DBA = 180 - 108 - 36 = 36$$

So BCD is an isosceles triangle as two angles are equal.

(Total for Question 29 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS