

Write your name here

Surname

Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9 - 1)

Centre Number

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Candidate Number

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Mathematics *model answers*

Paper 2 (Calculator)

Foundation Tier

Specimen Papers Set 2

Time: 1 hour 30 minutes

Paper Reference

1MA1/2F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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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

$$6819 \rightarrow 7000$$

819 is greater than 500,
so round up

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

write lowest -ve number
first

-5°C, -2°C, 3°C, 7°C, 10°C

(Total for Question 2 is 1 mark)

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

$$0.075 = \frac{75}{1000} = \frac{3}{40}$$

convert to
fraction

$\frac{3}{40}$

(Total for Question 3 is 2 marks)

- 4 Find the value of 5^4

$$\begin{aligned} 5^4 &= 5^2 \times 5^2 \\ &= 25 \times 25 = 625 \end{aligned}$$

*just type 5^4 into calculator

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?

$\frac{1}{3}$ of babies expected to live to 100:

$$720000 \times \frac{1}{3} = 240000$$

(Total for Question 5 is 2 marks)

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

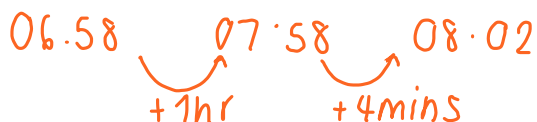
Swindon to London							
Swindon	06 10	06 27	06 41	06 58	07 01	07 17	07 28
Didcot	06 27	06 45	06 58	–	07 18	–	07 45
Reading	06 41	06 59	07 13	07 28	07 33	07 43	08 00
London	07 16	07 32	07 44	08 02	08 07	08 14	08 33

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

06.58 → 08.02

this takes 1hr 4mins

1hr 4mins



(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 from Swindon gets to London at 08.14, so takes 57minutes.

(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?

$$\begin{aligned}
 \text{total cost} &= (2 \times \text{£}1.10) + (3 \times 95\text{p}) + (5 \times \text{£}2.15) \\
 &= \text{£}2.20 + \text{£}2.85 + \text{£}10.75 \\
 &= \text{£}15.80
 \end{aligned}$$

$$\text{cost for each person} = \frac{\text{£}15.80}{5} = \text{£}3.16$$

↑ sharing between
5 people

£ 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?

**what fruit is picked the most?*

banana

(1)

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

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

$$\frac{2}{10} \times 100 = 2 \times 10 = 20\%$$

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.

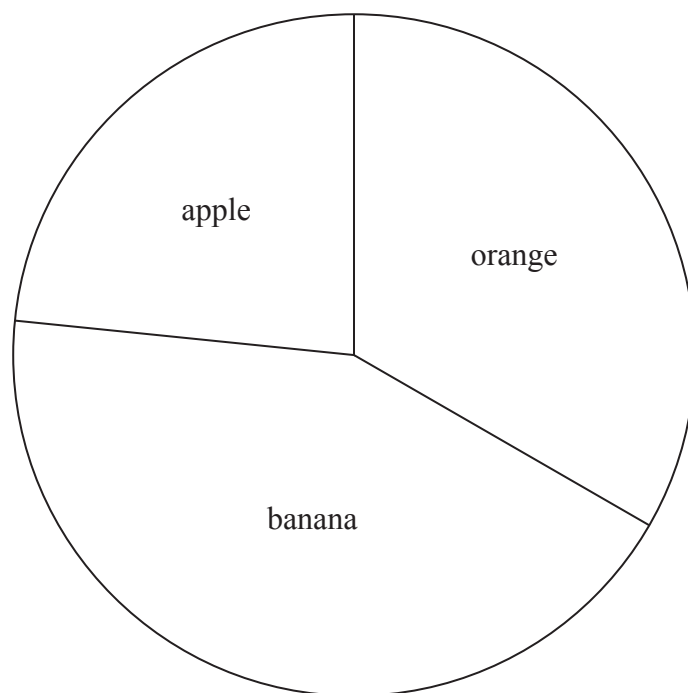


Diagram
accurately drawn

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.

In Rachel's survey, $\frac{5}{10}$ prefer bananas, which is a half of the sample. In Pete's survey, the pie chart shows bananas take up less than half of the diagram. (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,

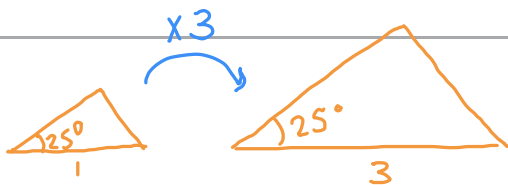
“The smallest angle of the enlarged triangle is 75° because $25 \times 3 = 75$ ”

Is Ben right?

Explain your answer.

no, as the angle will remain 25° , as all sides are enlarged by the same scale factor.

(Total for Question 9 is 1 mark)



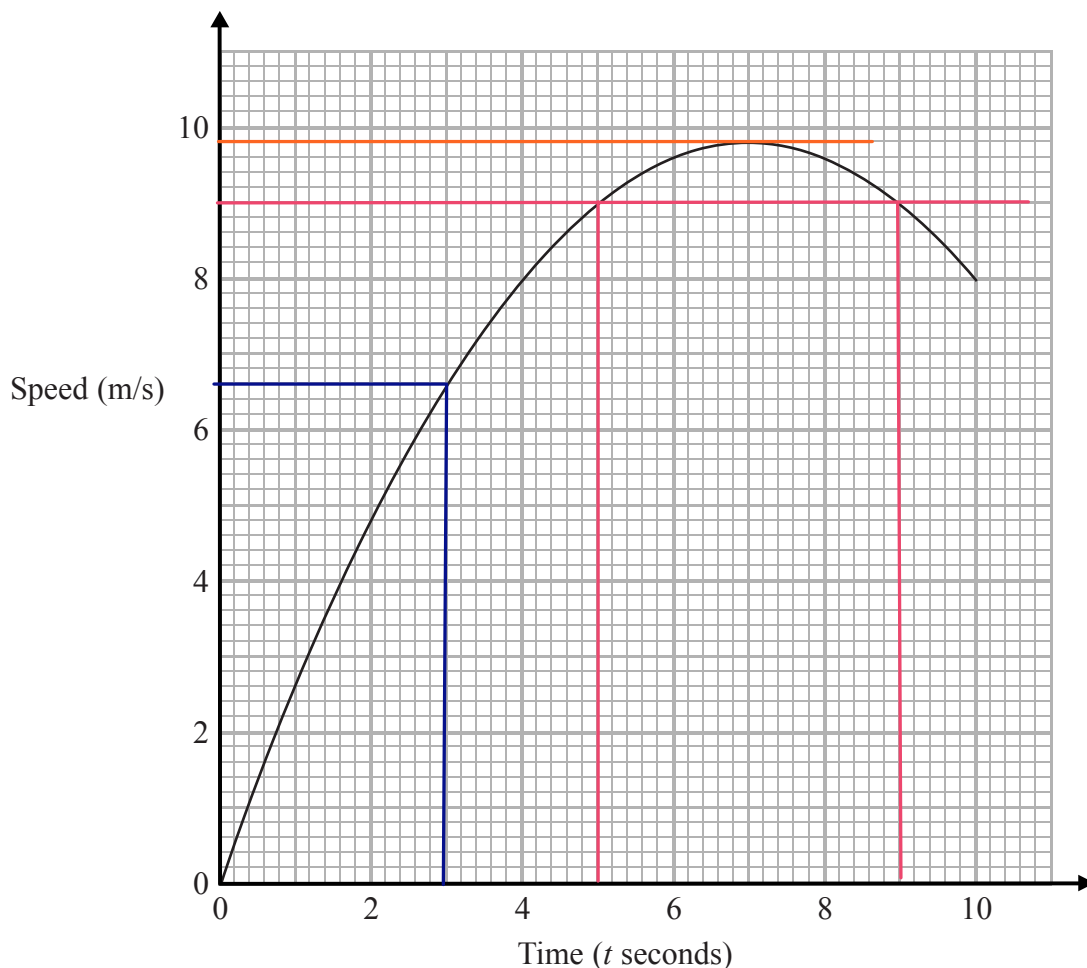
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10 Karol ran in a race.

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.

find t=3 on graph, and read off the speed

..... 6.6 m/s
(1)

(b) Write down Karol's greatest speed.

↳ speed at highest point on graph

..... 9.8 m/s
(1)

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

(c) Write down these two times.

find where speed = 9 m/s, and read off times

..... 5 seconds
..... 9 seconds
(1)

(Total for Question 10 is 3 marks)

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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 term doubles to get the next term

(1)

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

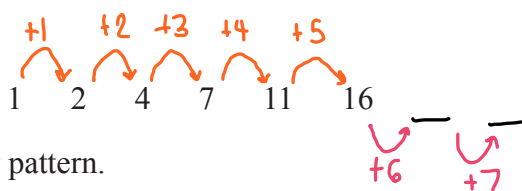
$$16 \times 2 = 32$$

32

(1)

Jack uses a different rule.

He says the first six terms of the number pattern are



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

7th term $\rightarrow 16 + 6 = 22$

8th term $\rightarrow 22 + 7 = 29$

22

29

(1)

(Total for Question 11 is 3 marks)

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- 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?

amount of soup going into bowls : $0.3 \times 24 = 7.2$ pints

leftover : $8 - 7.2 = \underline{0.8}$ pints

..... 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.

2.3% interest = 0.023 increase as a decimal multiplier

simple interest, so the same amount is added on each year

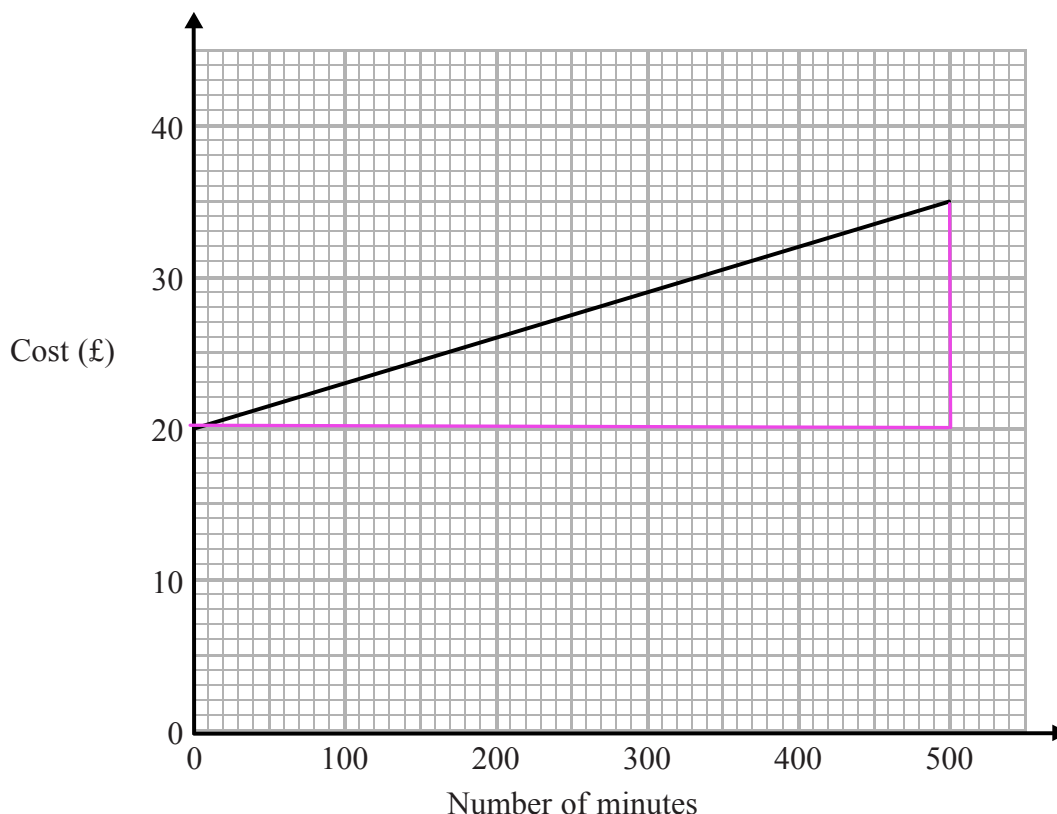
interest in 1 year : $£500 \times 0.023 = £11.50$

interest in 4 years : $4 \times £11.50 = £46$

£ 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.

charge for each minute = gradient

$$\Rightarrow \frac{35-20}{500-0} = \frac{15}{500} = \text{£}0.03$$

gradient = $\frac{\text{change in } y}{\text{change in } x}$

so, calls cost 3p per minute

3p

(Total for Question 14 is 2 marks)

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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.

$$\text{sugar : } \frac{250}{40} = 6.25 \text{ batches}$$

$$\text{dark choc : } \frac{550}{110} = \boxed{5 \text{ batches}}$$

Maximum of 5
batches can be made
with this amount of
ingredients.

each batch serves 2 people, so $5 \times 2 = 10$ 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?

$$\frac{6}{2} = 3, \text{ so this only enough for 3 batches}$$

hence, she can make mousse for less 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.

$$\text{average speed} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{200}{25} = 8 \text{ m/s}$$

..... 8 m/s

(Total for Question 16 is 1 mark)

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

$$= 7x - 3x + 2y + 4y \quad \text{group like terms}$$

$$= 4x + 6y$$

..... $4x + 6y$
(2)

(b) Factorise $10x - 15$

$$10x - 15 = \underline{5} (2x - 3)$$

find the common factor of 5

..... $5(2x - 3)$
(1)

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

$$\begin{array}{l} -3p \quad \downarrow \\ 2p = 8 \quad \downarrow -3p \\ \div 2 \quad \downarrow \\ p = 4 \quad \downarrow \div 2 \end{array}$$

$p =$ 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.

initially, same number of black and red

$$\frac{64}{2} = 32 \rightarrow 32 \text{ black, } 32 \text{ red}$$

$$\text{new no. red cards} \rightarrow 32 - 8 = 24$$

red : black

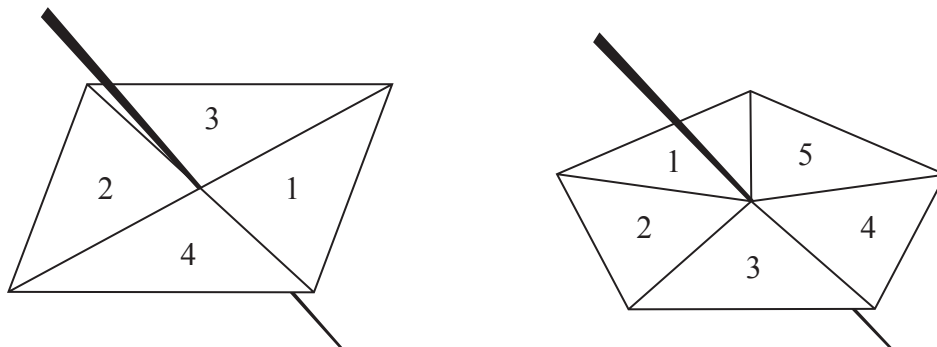
$$\begin{array}{l} \div 2 \downarrow 24 : 32 \\ \div 2 \downarrow 12 : 16 \downarrow \div 2 \\ \div 2 \downarrow 6 : 8 \downarrow \div 2 \\ \div 2 \downarrow 3 : 4 \downarrow \div 2 \end{array}$$

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

Handwritten notes: "add numbers from each spinner" with arrows pointing to the cells containing the sums.

(1)

Jeff spins each spinner once.

(b) Find the probability that Jeff gets

(i) a score of 3

Handwritten notes: "can score 3 by 1+2 or 2+1"

$$P(\text{scoring } 3) = \frac{2}{20} = \frac{1}{10}$$

Handwritten notes: "total of 20 combinations as 4 x 5 = 20" with an arrow pointing to the denominator 20. "÷2" is written above and below the fraction.

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

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(ii) a score of 5 or more.

$$P(\text{score 5 or more}) = \frac{14}{20} = \frac{7}{10}$$

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

(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.

$$\begin{aligned} 1 \text{ gallon} &= 4.55 \text{ L} \\ \times 20 \quad \downarrow & \quad \downarrow \times 20 \\ 20 \text{ gallons} &= 91 \text{ L} \end{aligned}$$

$$\begin{aligned} 20 \text{ gallons / min} &= 91 \text{ litres / 60 seconds} \\ &= 1.516 \text{ litres / second} \end{aligned}$$

1.52

litres per second

(Total for Question 20 is 2 marks)

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

<u>32</u>	
1	32
2	16
4	8

<u>48</u>	
1	48
2	24
3	16
4	12
6	8

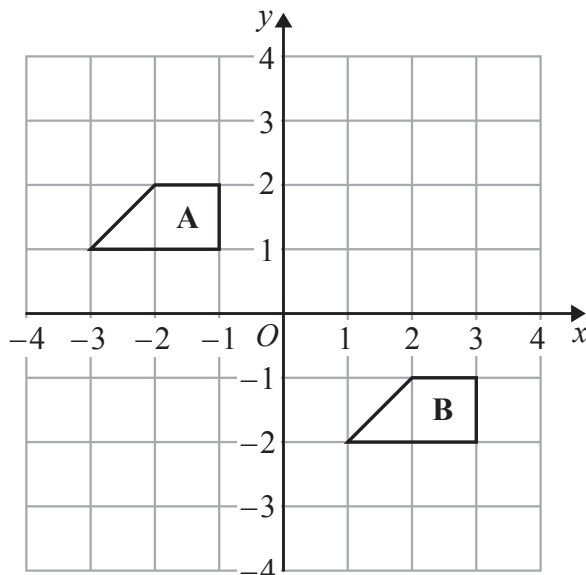
<u>72</u>	
1	72
2	36
3	24
4	18
6	12
8	9

HCF = 8

8

(Total for Question 21 is 2 marks)

22



moves 4 to the right, 3 down

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

translation of $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

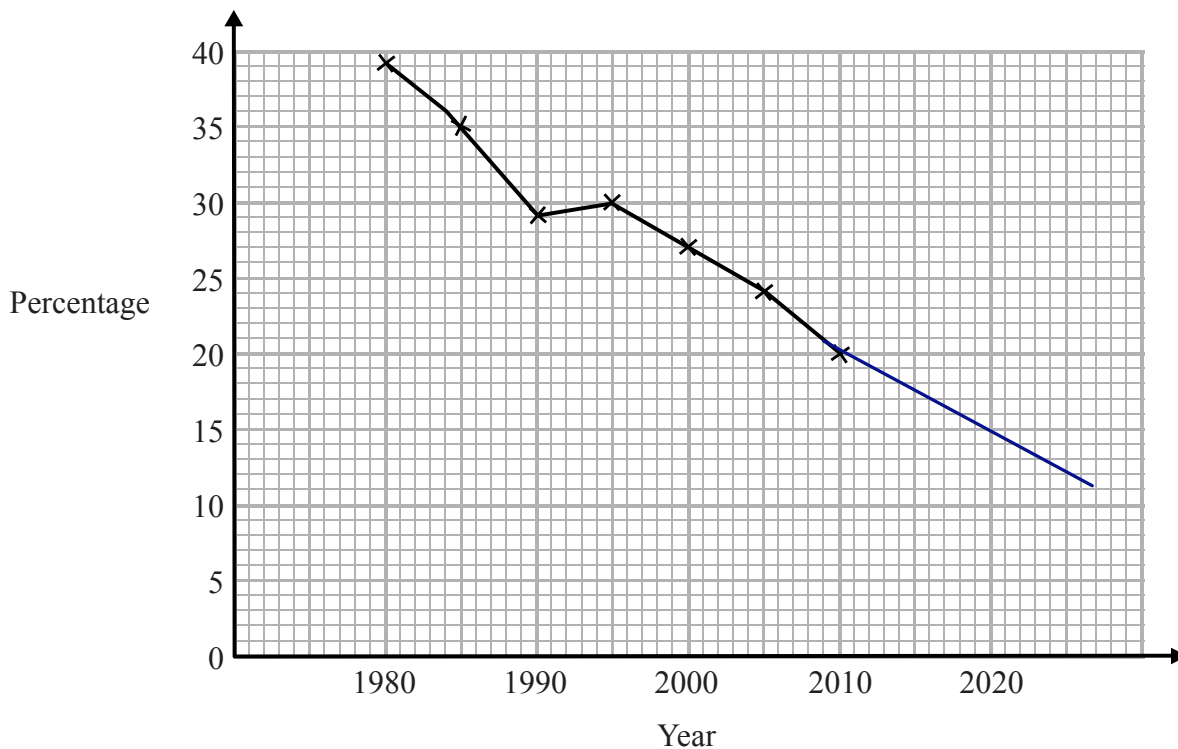
(Total for Question 22 is 2 marks)

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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.

the percentage of people using the shop decreases over time (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

continue on the trend, reading the percentage by 2020

15%
[allowed 13-17%]

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

no, 2020 is outside of the data range, so you have to extrapolate, which is unreliable.

the extend the graph beyond the actual data

(Total for Question 23 is 4 marks)

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

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

} expand brackets

$$= 13y - 1$$

$$\frac{13y - 1}{(2)}$$

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

$$= 5 \times u^2 \times w^4 \times 7 \times u \times w^3$$

$$= 35 u^3 w^7$$

$$\downarrow$$

$$5 \times 7 = 35$$

add powers when
they are
multiplied

$$\frac{35u^3w^7}{(2)}$$

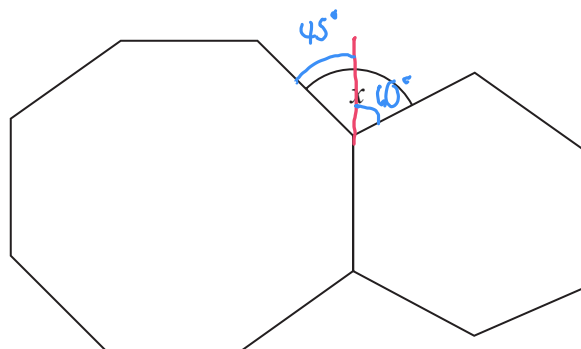
(Total for Question 24 is 4 marks)

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25



The diagram shows a regular octagon and a regular hexagon.

Find the size of the angle marked x
You must show all your working.

exterior angle
of regular polygon = $\frac{360}{n}$

n being number of sides
as exterior angles sum 360° .

octagon: $\frac{360}{8} = 45^\circ$

hexagon: $\frac{360}{6} = 60^\circ$

$x = 45 + 60 = 105^\circ$

$x = 105^\circ$

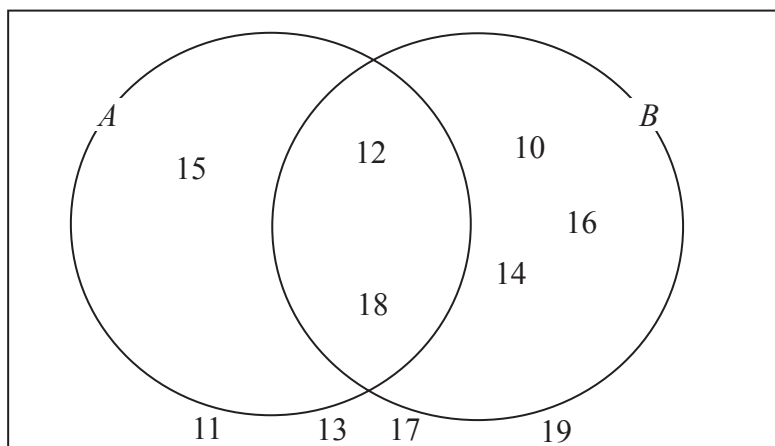
(Total for Question 25 is 3 marks)

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26 Here is a Venn diagram.



(a) Write down the numbers that are in set

(i) $A \cup B$
 ↘ in A or B or both

10, 12, 14, 15, 16, 18

(ii) $A \cap B$
 ↘ in A and 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'

10 numbers in total

set A' means not in set A

↪ 7 numbers not in A

$$P(\text{in set } A') = \frac{7}{10}$$

$\frac{7}{10}$

(2)

(Total for Question 26 is 4 marks)

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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?

$$C : S = 6 : 5 \xrightarrow{\times 2} 12 : 10$$

$$S : P = 2 : 1 \xrightarrow{\times 5} 10 : 5$$

to get sheep to be the same number

$$C : S : P = 12 : 10 : 5$$

$$\text{number of parts} = 12 + 10 + 5 = 27$$

$$\frac{10}{27} \text{ animals are sheep}$$

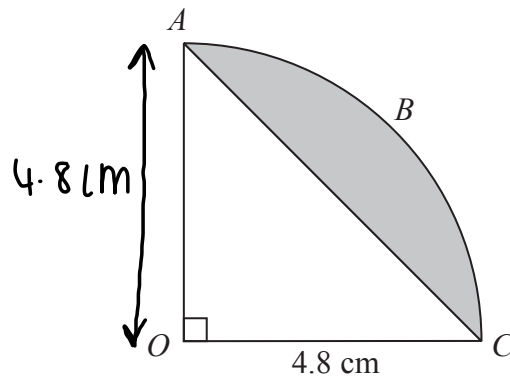
$$\text{number of sheep} = 189 \times \frac{10}{27} = 70$$

189 animals in total

70

(Total for Question 27 is 3 marks)

28



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.

area of sector :

$$= \frac{1}{4} \times \text{area of circle} \quad \nearrow \pi r^2$$

$$= \frac{1}{4} \times \pi \times 4.8^2 = 5.76\pi \text{ cm}^2$$

area of white triangle:

$$= \frac{1}{2} \times \text{base} \times \text{height}$$

$$= 4.8 \times 4.8 \times \frac{1}{2} = 11.52 \text{ cm}^2$$

shaded area = area of sector - white triangle

$$= 5.76\pi - 11.52 = \underline{\underline{6.58 \text{ cm}^2}} \quad (3 \text{ sf})$$

6.58 cm²

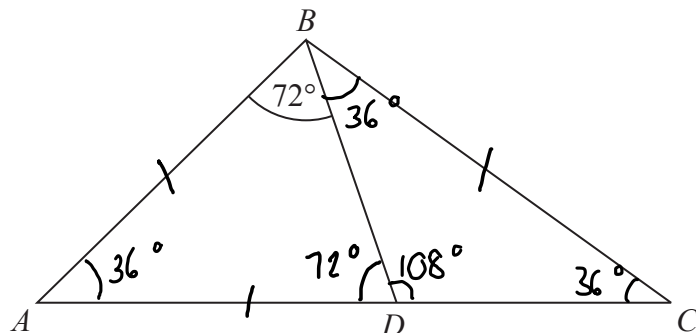
(Total for Question 28 is 3 marks)

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29



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.

$\angle ABD = 72^\circ$, because base angles in an isosceles triangle are equal

$\angle BAD = 180 - 72 - 72 = 36^\circ$, because angles in a triangle sum 180° .

$\angle BCA = 36^\circ$, because base angles in an isosceles are equal

$\angle BDC = 108^\circ$, because angles on a straight line sum 180° .

$$180 - 72 = 108$$

$\angle DBC = 180 - 108 - 36 = 36^\circ$, because angles in a triangle sum 180° .

hence, $\triangle BCD$ is isosceles, as it has two equal angles.

(Total for Question 29 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS