



- 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.

Advice

- 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.

Information

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



Instructions

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.		Total Marks
Mathematics Paper 3 (Calculator) Foundation Tier <i>worked solutions (1k)</i>		
Afternoon (Time: 1 hour 30 minutes)		Paper Reference 1MA1/3F
Monday 11 November 2019		
Pearson Edexcel Level 1/Level 2 GCSE (9–1)		Centre Number
Candidate surname 		Candidate Number
Other names 		
Please check the examination details below before entering your candidate information		



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down two factors of 12

(Total for Question 1 is 1 mark)

Any two of
1, 2, 3, 4, 6, 12

2 Find $\frac{1}{3}$ of 30

$$30 \div 3 =$$

(Total for Question 2 is 1 mark)

10

3 Write 0.7 as a fraction.

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

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

7 8 15 16 18 22

Write down the number from the list that is a multiple of 6

18

(Total for Question 4 is 1 mark)

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5 Change 4 kilometres into metres.

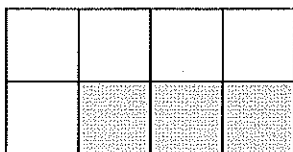
$$1 \text{ km} = 1000 \text{ m}$$

$$4 \text{ km} =$$

4000 metres

(Total for Question 5 is 1 mark)

6 Here is a grid of squares.



Write down the ratio of the number of shaded squares to the number of unshaded squares.

3:5

(Total for Question 6 is 1 mark)

7 $w = 4u + 3$

Find the value of w when $u = 8$

$$w = 4 \times 8 + 3$$

(Total for Question 7 is 2 marks)

8 Here are the first five terms of a sequence.

Write down the next two terms of the sequence.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

(Total for Question 8 is 2 marks)



9 Mrs Brown asked each child in her class which pet they liked best.

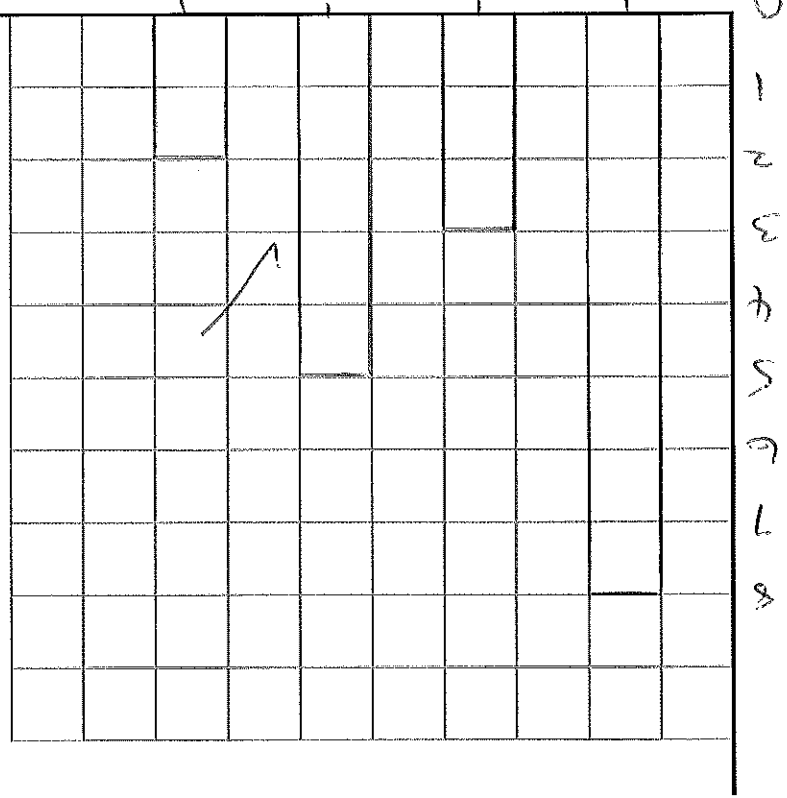
Here are her results.

dog	rabbit	cat	dog	dog	hamster
cat	dog	rabbit	cat	hamster	cat
dog	dog	cat	dog	rabbit	dog

(a) Complete the frequency table for this information.

Pet	Tally	Frequency
dog		8
rabbit		3
cat		5
hamster		2

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



(c) Write down the most popular pet.

Dog
Rabbit
Cat
Hamster
pet

(Total for Question 9 is 6 marks)

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(1) correct
(2) tally

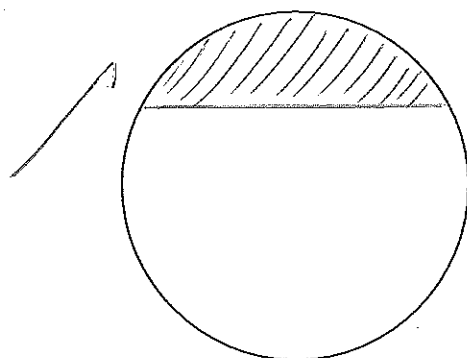
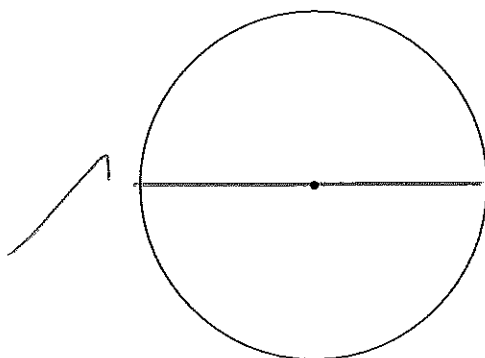
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10

- (a) On the diagram above, draw a diameter of the circle.
- (b) On the diagram below, draw a segment of the circle. Shade the segment.



(Total for Question 10 is 2 marks)



P 5 8 8 7 5 A 0 5 2 4

5

Turn over



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11 Dylan buys 13 bicycle lights for £7.50 each.
He pays with five £20 notes.

(a) How much change should Dylan get?

$$5 \times £20 = £100$$

$$13 \times £7.50 = 97.50$$

$$£100 - 97.50 =$$

(3)

£ 2.50 ✓

The normal price of a bicycle is £120

In a sale, there is $\frac{1}{5}$ off the normal price of the bicycle.

(b) Work out the price of the bicycle in the sale.

$$\frac{1}{5} \times £120 = 24$$

$$£120 - £24 =$$

(2)

£ 96 ✓

(Total for Question 11 is 5 marks)

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12 Cornflakes are sold in two sizes of box.

Size of box	Weight of cornflakes
small	450 g
large	750 g

Rae buys 3 small boxes of cornflakes and some large boxes of cornflakes.
In total she buys 5850 g of cornflakes.

Work out the number of large boxes of cornflakes Rae buys.

$$\text{small } 3 \times 450 = 1350 \text{ g}$$

$$5850 - 1350 = 4500$$

$$\frac{4500}{750} = 6 \text{ large boxes}$$

6

(Total for Question 12 is 3 marks)



Turn over



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13 The stem and leaf diagram below gives information about the ages of people in a social club.

3	1	4	5
4	0	2	2
5	0	1	7
6	3	4	5
7	0	4	

Find the range of these ages.

74 - 31

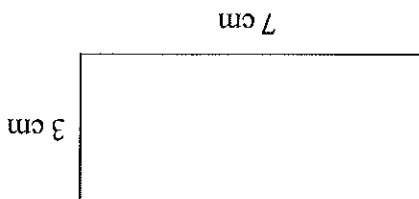
..... years

43

Key: 4|2 represents 42 years

(Total for Question 13 is 2 marks)

14 Here is a rectangle.



Coby has to find the perimeter of this rectangle.

He writes,

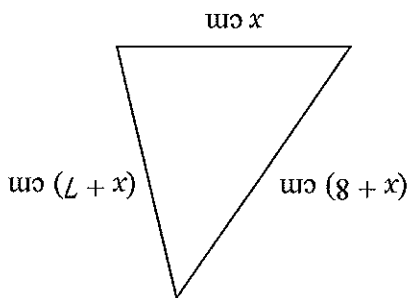
$$\text{Perimeter} = 7 \times 3$$

(a) What mistake has Coby made?

He has calculated the area instead of the perimeter

(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.

You cannot have a side length that is negative

(1)

(Total for Question 14 is 2 marks)





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(Total for Question 15 is 4 marks)

72

✓ Packed lunch 31% of 800 = 248 ✓

✓ Boys 55% of 800 = 440 } Girls 45% of 800 = 360 ✓

✓ P.L. 40% of 440 = 176 Boys ✓

✓ P.L. 248 - 176 = 72 Girls ✓

15 There are 800 students at a school.
Each student has either a school dinner or a packed lunch.
31% of the students have packed lunches.
55% of the students are boys.
60% of the boys have school dinners.
How many girls have packed lunches?
You must show all your working.

- 16 In a bag there are only red counters, blue counters, green counters and yellow counters. A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	Probability
red	0.4
blue	0.15
green	0.20
yellow	0.25

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

$$0.4 + 0.25 = 0.65$$

$$1 - 0.65 = 0.35 \quad \text{Blue and green}$$

$$\begin{matrix} 3 \\ 4 \end{matrix}$$

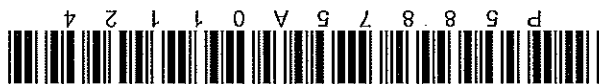
$$3 + 4 = 7$$

$$0.35 \div 7 = 0.05$$

$$\text{Blue} = 3 \times 0.05 = 0.15$$

$$\text{Green} = 4 \times 0.05 = 0.20$$

(Total for Question 16 is 4 marks)



P 5 8 8 7 5 A 0 1 1 2 4



(Total for Question 17 is 4 marks)

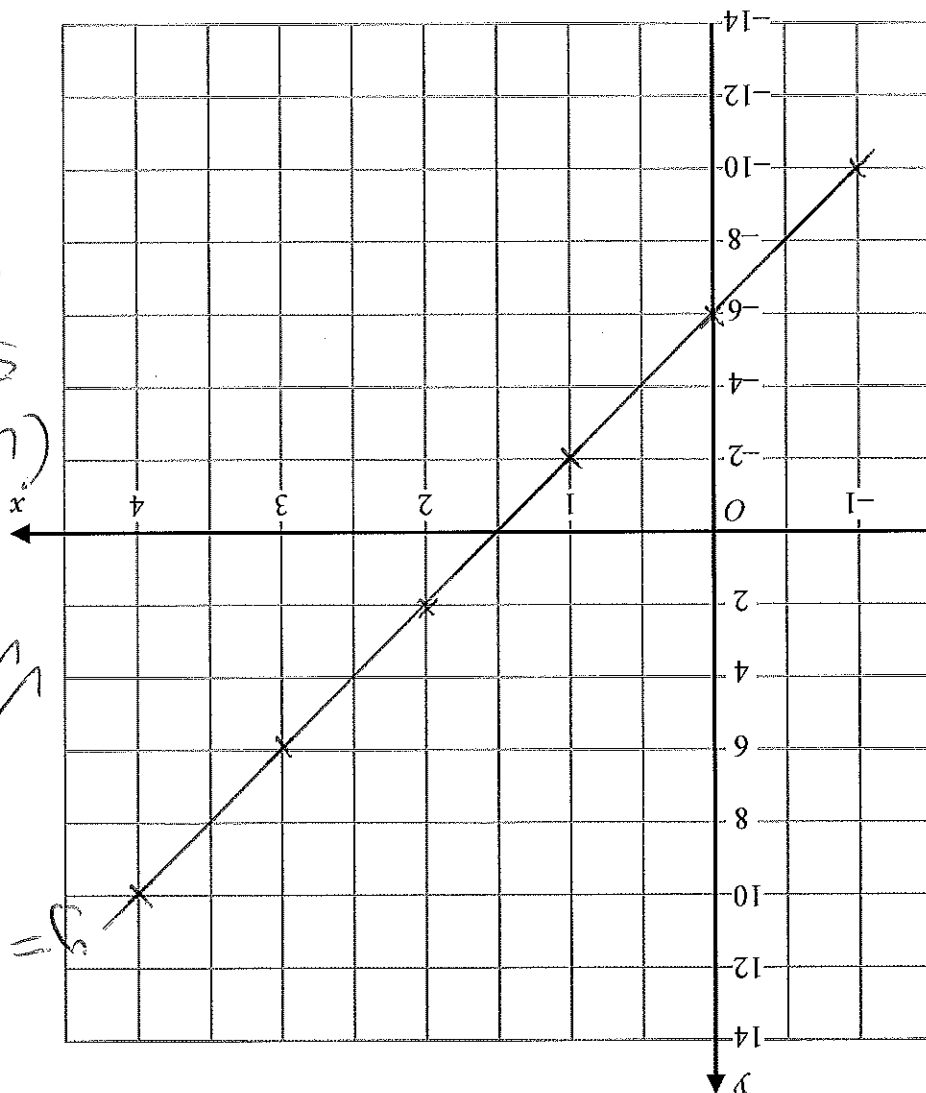
(2)

(✓ for
5 plotted
correctly)

(✓ for
5 plotted
correctly)

///

$y = 4x - 6$



(b) On the grid, draw the graph of $y = 4x - 6$ for values of x from -1 to 4

(2)

y	x
-10	-1
-6	0
-2	1
2	2
6	3
10	4

17 (a) Complete the table of values for $y = 4x - 6$

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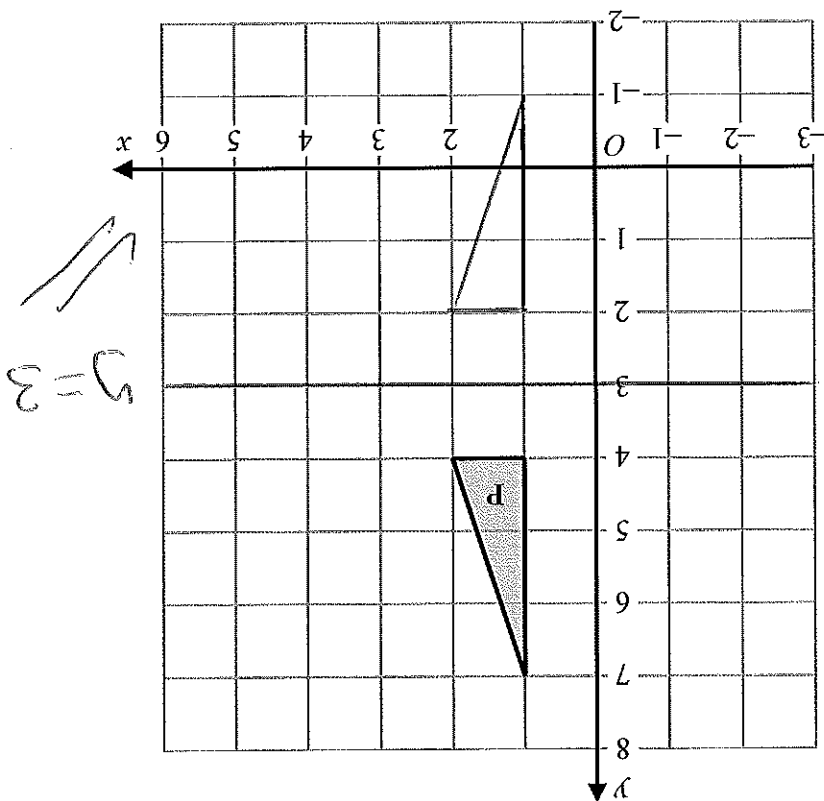
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Reflect shape P in the line $y = 3$



(Total for Question 18 is 2 marks)

✓ Correct reflection
in any other line



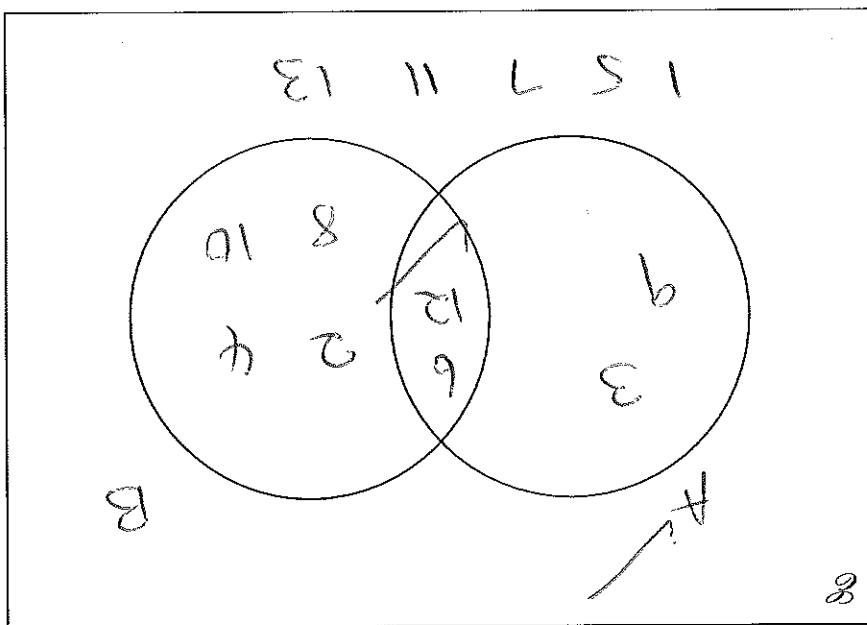
P 5 8 8 7 5 A 0 1 3 2 4



(Total for Question 20 is 4 marks)

✓ completely correct
Venn diagram

✓ Set A
or B
Correct
(A ∪ B)
Correct



Complete the Venn diagram for this information.

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

(Total for Question 19 is 2 marks)

19 Solve $4(x - 6) = 44$

$$\begin{aligned} 4x - 24 &= 44 \\ 4x &= 68 \\ x &= 17 \end{aligned}$$

✓

$$x = 17$$

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

Difference
= 11720 ✓

Calculate the percentage profit Franco makes.

$$\frac{\text{Difference}}{\text{original price}} \times 100 = \frac{158\,220 - 146\,500}{146\,500} \times 100$$

✓

8
✓
%

(Total for Question 21 is 3 marks)





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(Total for Question 23 is 3 marks)

(1)

✓ 157.7

(b) Write your answer to part (a) correct to 4 significant figures.

(2)

157.66825

✓ 836.4 or 5.36... seen
5.3648091

Write down all the figures on your calculator display.

23 (a) Use your calculator to work out $\frac{29^2 - 4.6}{\sqrt{35 - 1.9^3}}$

(Total for Question 22 is 4 marks)

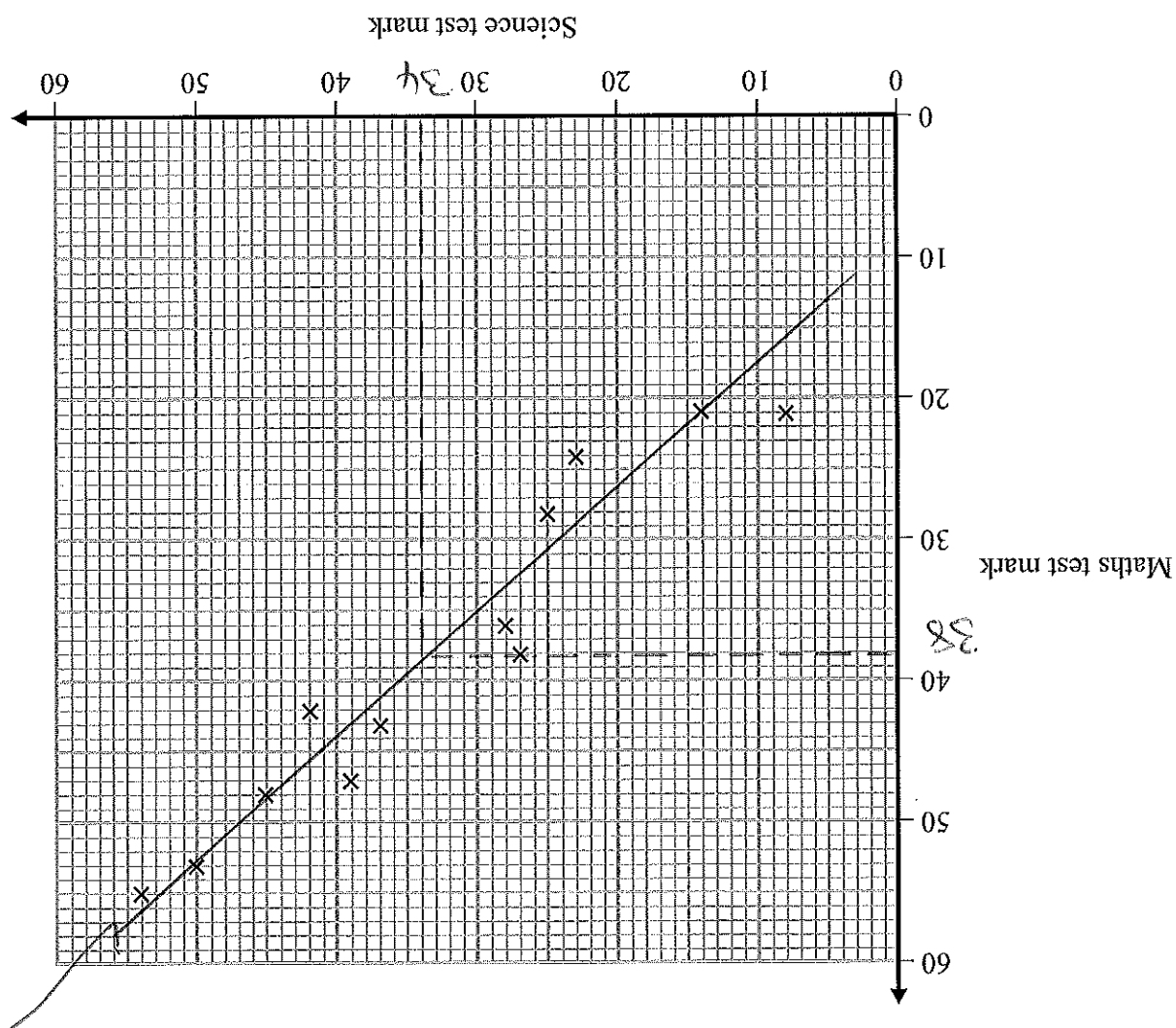
(2)

✓ $3(3x^2 + 2x)$ partial factorisation
✓ $3x(x + 2)$ (b) Factorise fully $9x^2 + 6x$

(2)

✓ $x^2 - 9x + 5x - 45$
✓ $x^2 - 4x - 45$ 22 (a) Expand and simplify $(x + 5)(x - 9)$

24 The scatter graph shows information about the marks a group of students got in a Science test and in a Maths test.



Jamie got a mark of 34 in the Science test.

Using the scatter graph, find an estimate for Jamie's mark in the Maths test.

$$(30 - 40)$$

38

(Total for Question 24 is 2 marks)





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

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

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

$$18 \times 335$$

$$180$$

$$122.5$$

$$25$$

$$7.5$$

$$46$$

$$335 \div 18 = 18.6$$

seconds

(Total for Question 25 is 3 marks)

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26 Write 37 cm^3 in mm^3

$$1 \text{ cm}^3 = 1000 \text{ mm}^3$$

$$37 \text{ cm}^3 = 37000 \text{ mm}^3$$

37000 mm³

(Total for Question 26 is 1 mark)

27 Nimer was driving to a hotel.
He looked at his Sat Nav at 1330

Time	Distance to destination
1330	65 miles

Nimer arrived at the hotel at 1448

Work out the average speed of the car from 1330 to 1448
You must show all your working.

$$1330 - 1448 = 1 \text{ hour } 18 \text{ minutes}$$

$$= 1.3 \text{ hours}$$

$$65 \div 1.3 = 50 \text{ mph}$$

$$S = \frac{D}{T}$$

50 mph

(Total for Question 27 is 4 marks)





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28 (a) Write 32 460 000 in standard form.

(b) Write 4.96×10^{-3} as an ordinary number.

(1)

3.246×10^7

Asma was asked to compare the following two numbers.

$A = 6.212 \times 10^8$ and $B = 4.73 \times 10^9$

She says,

“6.212 is bigger than 4.73 so A is bigger than B.”

(c) Is Asma correct?

You must give a reason for your answer.

B is bigger as the power of 10 is bigger ✓

(1)

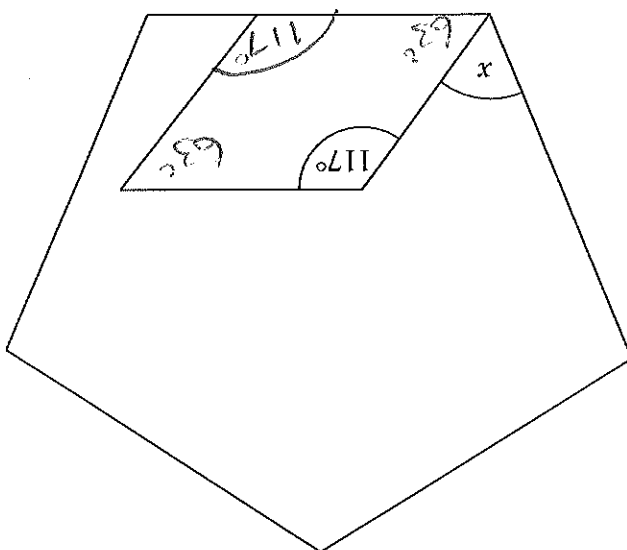
(Total for Question 28 is 3 marks)

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29 The diagram shows a regular pentagon and a parallelogram.



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

$$2 \times 117 = 234$$

$$360 - 234 = 126$$

$$126 \div 2 = 63$$

$$\text{Interior angles of pentagon} = (5-2) \times 180$$

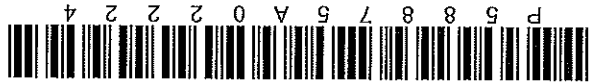
$$= 3 \times 180 = 540$$

$$540 \div 5 = 108^\circ$$

$$108 - 63 = 45^\circ$$

(Total for Question 29 is 4 marks)





TOTAL FOR PAPER IS 80 MARKS

(Total for Question 30 is 3 marks)

$$\begin{aligned} \text{Radius of } B &= \sqrt{6.25} \\ &= 2.5 \text{ cm} \end{aligned}$$

$$\text{Area } B = 19.634954 \text{ cm}^2$$

$$\begin{aligned} &\div 9 \\ &= 19.634954 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} &\div 4 \\ &= 176.7145 \text{ cm}^2 \end{aligned}$$

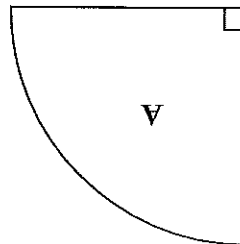
$$= 706.8583471$$

$$\text{Area of circle } A = \pi r^2 = \pi \times 15^2$$

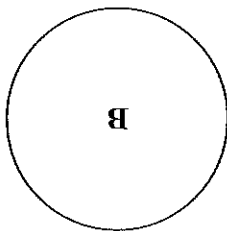
Show that the radius of B is 2.5 cm.

The area of A is 9 times the area of B.

15 cm



30 A is in the shape of a quarter circle of radius 15 cm.
B is in the shape of a circle.



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