Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Time 2 hours

Paper reference **4MA1/1F**

Mathematics A

PAPER: 1F

Foundation Tier

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used**.
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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

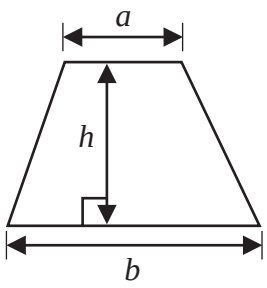
- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ▶

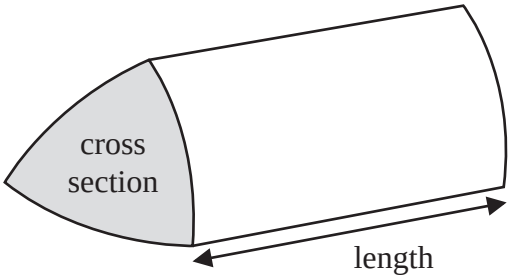
International GCSE Mathematics

Formulae sheet – Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

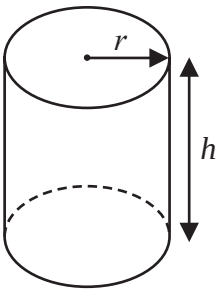


Volume of prism = area of cross section × length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Answer all TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1

8	9	17	35	48	80

From the numbers in the box, write down

(a) a factor of 40

8 (1)

.....

(1)

(b) a multiple of 7

35 (1)

.....

(1)

(c) a prime number

17 (1)

.....

(1)

(d) a square number

$3^2 = 9$

9 (1)

.....

(1)

(e) the two numbers with a difference of 31

$48 - 17 = 31$

48 and 17 (1)

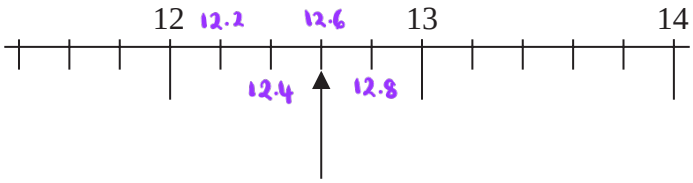
..... and .....

(1)

(Total for Question 1 is 5 marks)

2 The diagram shows part of a number line.

$\frac{13-12}{5} = 0.2$



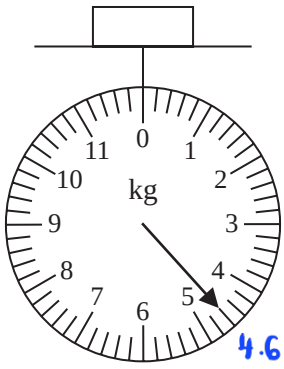
(a) Write down the number marked with the arrow.

12.6 (1)

.....

(1)

The diagram shows a parcel on weighing scales.



The parcel weighs less than 6 kg.

(b) How many kilograms less?

$6 - 4.6 = 1.4$

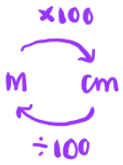
1.4 (1) kilograms

.....

(1)

(c) Change 7.6 metres into centimetres.

$7.6 \times 100 = 760$



760 (1) centimetres

.....

(1)

(d) Change 91 600 millilitres into litres.

$91600 \div 1000 = 91.6$

91.6 (1) litres

.....

(1)

Ivan goes to the gym at 7 15 pm.

(e) Write this time using the 24-hour clock.

19 15 (1)

.....

(1)

(Total for Question 2 is 5 marks)

3 Find the number that is exactly halfway between 3.7 and 6.1

$\frac{6.1 - 3.7}{2} = \frac{2.4}{2} = 1.2$ (1)

$3.7 + 1.2 = 4.9$ (1)

4.9

(Total for Question 3 is 2 marks)

4 (a) Simplify $3 \times 10d$

$(3 \times 10)d$

$= 30d$

$30d$ (1)

(1)

(b) Simplify $8e + e - 5e$

$4e$ (1)

(1)

(c) Solve $6g = 42$

$6g = 42$

$g = \frac{42}{6} = 7$

$g =$ 7 (1)

(1)

(d) Solve $24 = 10 + h$

$h = 24 - 10$

$= 14$

$h =$ 14 (1)

(1)

(Total for Question 4 is 4 marks)

5 (a) Write these numbers in order of size.

Start with the smallest number.

2.08 2.13 2.7 2.0034 2.111

2.0034 , 2.08 , 2.111 , 2.13 , 2.7 (1)

.....

(1)

(b) Write 5.8394 correct to 2 decimal places.

↘ more than 5. round up 3 to 4.

5.84 (1)

.....

(1)

(c) Write 0.73 as a fraction.

$\frac{73}{100}$ (1)

.....

(1)

(d) Write down the value of the 6 in the number 0.067

hundredths (1)

.....

(1)

(e) Write 17% as a decimal.

$\frac{17}{100} = 0.17$

0.17 (1)

.....

(1)

70% of a number is 252

(f) Work out the number.

$\frac{70}{100} \times n = 252$

$n = 252 \times \frac{100}{70}$ (1)

$= 360$ (1)

360

.....

(2)

(Total for Question 5 is 7 marks)

6 Janine has 2 litres of orange squash.

×1000
litre millilitre
÷1000

She also has some empty cups.
When full, each cup holds 300 millilitres of orange squash.

Janine fills as many cups as possible.

How much orange squash does Janine have left after filling as many cups as possible?
State the units of your answer.

Jamie has : 2 × 1000
= 2000 ml (1)

2000 / 300 = 6.66 ..... (1)

Balance = 0.66... × 300
= 200 ml (1)

200 ml

(Total for Question 6 is 3 marks)

7 The diagram shows a rectangle and a square.

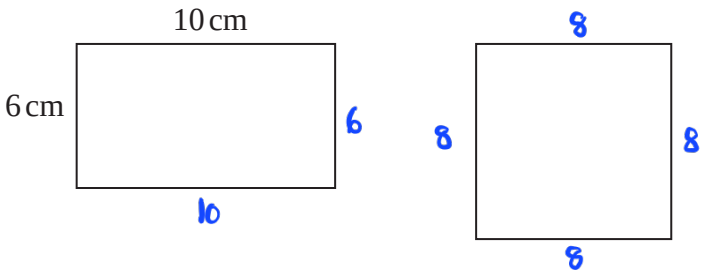


Diagram **NOT** accurately drawn

The perimeter of the rectangle is equal to the perimeter of the square.
The area of the rectangle is less than the area of the square.

Work out by how much the area of the rectangle is less than the area of the square.

Rectangle

Perimeter = 10 + 10 + 6 + 6
= 32 cm (1)

Area = 10 × 6
= 60 cm² (1)

Square

Perimeter = 32 cm (each side 8 cm)

Area = 8 × 8
= 64 cm² (1)

Difference : 64 − 60 = 4 cm² (1)

4 cm²

(Total for Question 7 is 4 marks)

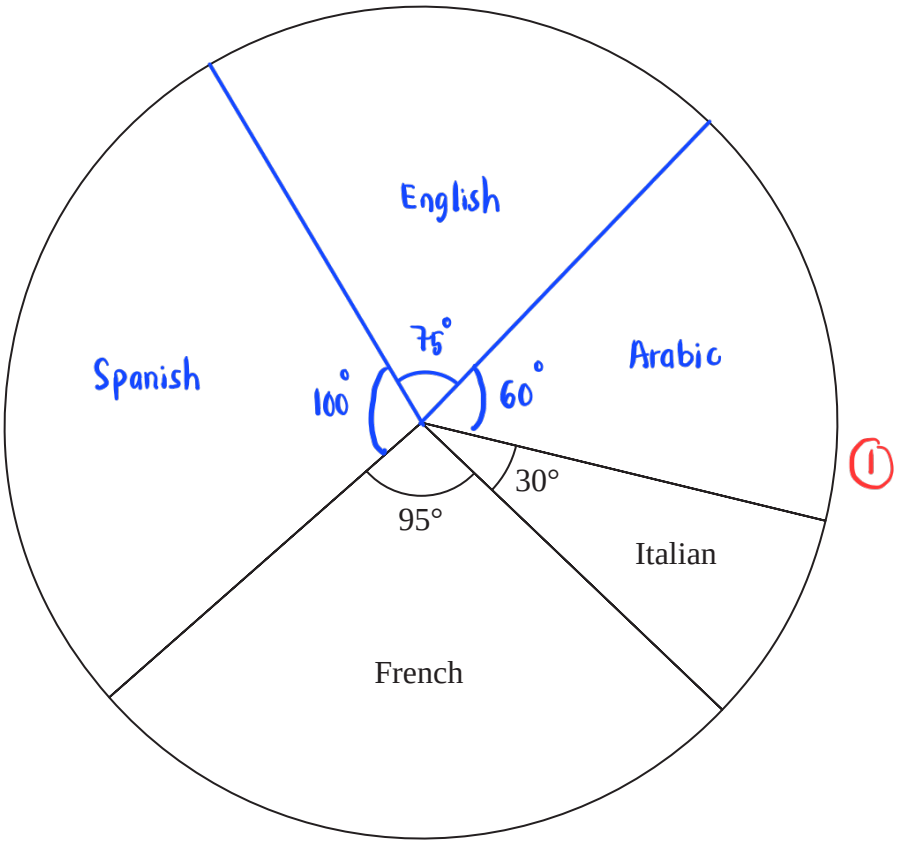
8 Some students leaving a language school one day were each asked which language lesson they had just attended.

The table and the pie chart give some information about their answers.

Language	Frequency	Angle in pie chart
Italian	24	30°
French	76	95°
Arabic	48	60°
English	60	75°
Spanish	80	100°

(1)

(1)



(1)

(a) Work out the number of students who answered French.

Finding total number of students:

$\frac{30}{360} \times N = 24$

$N = 24 \times \frac{360}{30}$

$= 288$ (1)

French: $\frac{95}{360} \times 288$

$= 76$ (1)

76

(2)

(b) Complete (i) the table and (ii) the pie chart.

(3)

English: $288 - 80 - 48 - 76 - 24$

$= 60$

$\angle$ Arabic $= \frac{x}{360} \times 288 = 48$

$x = 60^\circ$

$\angle$ Spanish $= \frac{z}{360} \times 288 = 80$

$z = 100^\circ$

$\angle$ English $= \frac{y}{360} \times 288 = 60$

$y = 75^\circ$

(Total for Question 8 is 5 marks)

9 In a shop, pens cost 34 cents each.

The shop has a special offer on the pens.

Special offer

Pay for 2 pens and get 1 free


34 cents


34 cents


Free

Moritz wants 25 pens.

Work out how much Moritz has to pay for 25 pens.

$\frac{25}{3} = 8.333\ldots$ (1)

∴ Moritz needs to buy 8 sets of 3 pens on offer.

1 set = 34 cents + 34 cents
= 68 cents

8 sets = 68 cents × 8
= 544 cents

∴ To get 25 pens, Moritz needs to buy 8 set of 3 pens + 1 pen

544 cents + 34 cents (1)
= 578 cents (1)

578 cents

(Total for Question 9 is 3 marks)

10 (a) Write these fractions in order of size.
Start with the smallest fraction.

$\frac{3}{8}$ $\frac{1}{4}$ $\frac{7}{20}$ $\frac{5}{16}$

Convert fraction to decimals :

$\frac{3}{8} = 0.375$ $\frac{7}{20} = 0.35$

$\frac{1}{4} = 0.25$ $\frac{5}{16} = 0.3125$

$\frac{1}{4}, \frac{5}{16}, \frac{7}{20}, \frac{3}{8}$ (2)

(2)

There are only green beads and red beads in a bag.

The ratio of the number of green beads to the number of red beads is 5 : 9

(b) What fraction of the beads in the bag are green beads?

Total ratio = 5 + 9 = 14

$\frac{5}{14}$ (1)

(1)

(Total for Question 10 is 3 marks)

11 The diagram shows a square *ABCD* and a regular pentagon *CDEFG*.

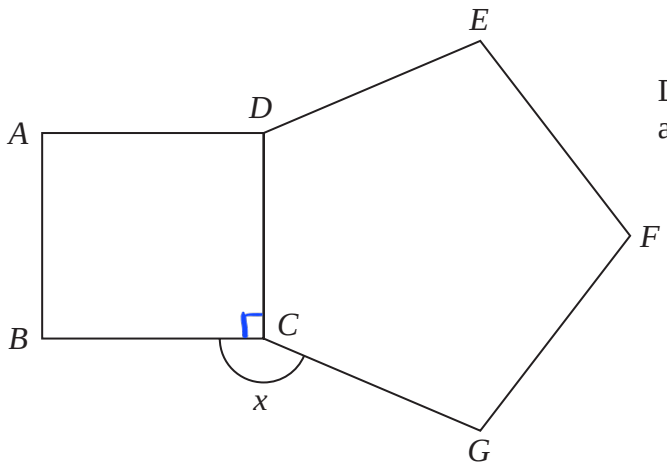


Diagram **NOT** accurately drawn

Work out the size of the angle marked *x*.

angle DCB = 90°

angle DCG = $\frac{5-2}{5} \times 180°$ – interior angle of a pentagon

= 108° (1)

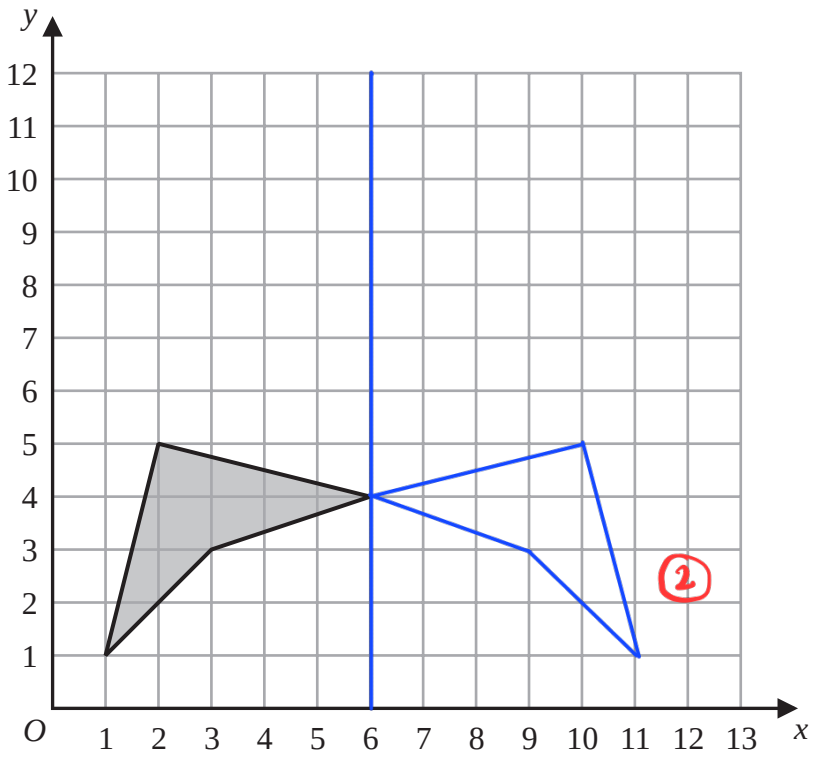
angle BCG = 360° – 90° – 108° (1)

= 162° (1)

162 °

(Total for Question 11 is 3 marks)

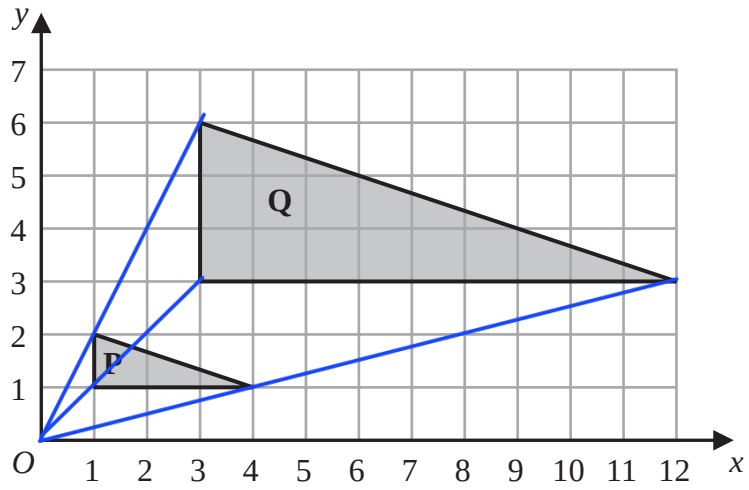
12 The diagram shows a shaded shape on a grid.



(a) On the grid, reflect the shape in the line with equation $x = 6$

(2)

The diagram below shows triangle **P** and triangle **Q** drawn on a grid.



(b) Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

(3)

Enlargement of scale factor 3 at point (0,0)
1 1 1

(Total for Question 12 is 5 marks)

13 Buses leave a bus station to go to the hospital every 16 minutes.
Buses leave the same bus station to go to the college every 20 minutes.

At 9 am a bus leaves the bus station to go to the hospital and at the same time a bus leaves the bus station to go to the college.

Work out the next time that a bus leaves the bus station to go to the hospital and at the same time a bus leaves the bus station to go to the college.

Hospital : 9.00 , 9.16 , 9.32 , 9.48 , 10.04 , 10.20 (1)

College : 9.00 , 9.20 , 9.40 , 10.00 , 10.20 (1)

∴ The bus next leave at the same time at 10.20 am. (1)

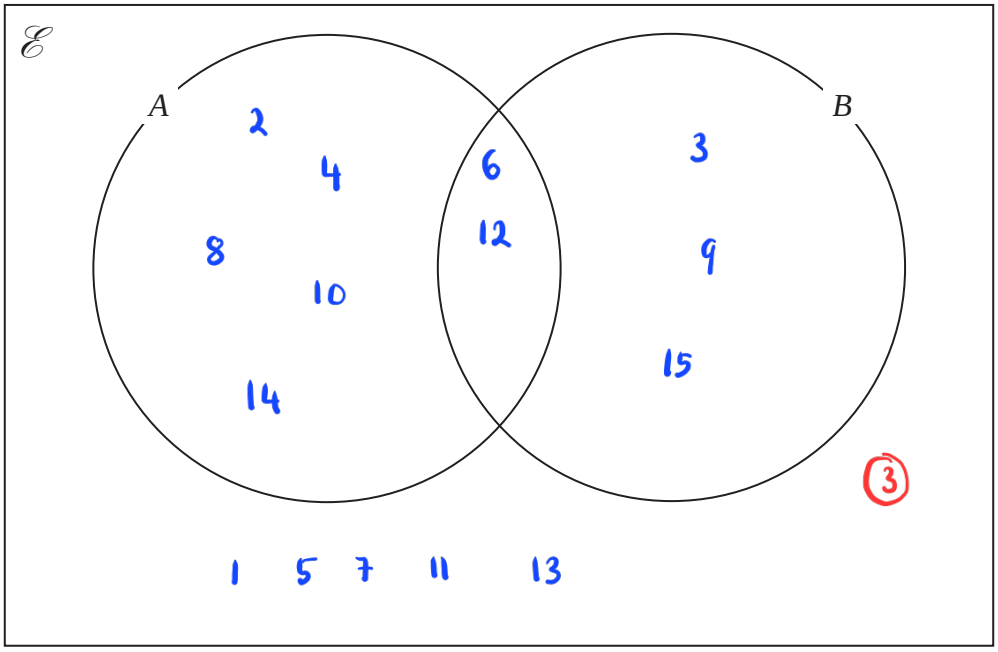
10 20

(Total for Question 13 is 3 marks)

14 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}

A = {even numbers}

B = {multiples of 3}



Complete the Venn diagram for the sets $\mathscr{E}$, A and B.

(Total for Question 14 is 3 marks)

15 150 students were each asked to name their favourite sport from hockey, rugby and football.

The two-way table gives information about the results.

	Hockey	**Rugby**	**Football**	Total
Year 10	12	42	24	78
Year 11	27	16	29	72
Total	39	58	53	150

(3)

(a) Complete the two-way table.

(3)

(b) Work out what percentage of the 150 students are in year 10

$\frac{78}{150} \times 100\%$ (1)

$= 52\%$ (1)

52 .....%

(2)

(Total for Question 15 is 5 marks)

16 A plane flew from Madrid to Dubai.

The distance the plane flew was 5658 km.
The flight time was 8 hours 12 minutes.

Work out the average speed of the plane.

Speed = distance / time

Convert 12 minutes to hours :

$\frac{12}{60} = 0.2$ hours

∴ Flight time is 8.2 hours (1)

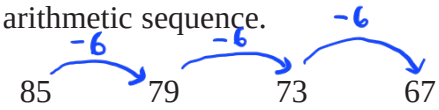
Speed = $\frac{5658 \text{ km}}{8.2 \text{ h}}$ (1)

= 690 km/h (1)

690 km/h

(Total for Question 16 is 3 marks)

17 Here are the first 4 terms of an arithmetic sequence.



Find an expression, in terms of *n*, for the *n*th term of the sequence.

Common difference, d = −6

first term, a = 85

$T_n = a + (n-1)d$

$T_n = 85 + (n-1)(-6)$ (1)

$= 85 - 6n + 6$

$= 91 - 6n$ (1)

$91 - 6n$

(Total for Question 17 is 2 marks)

18

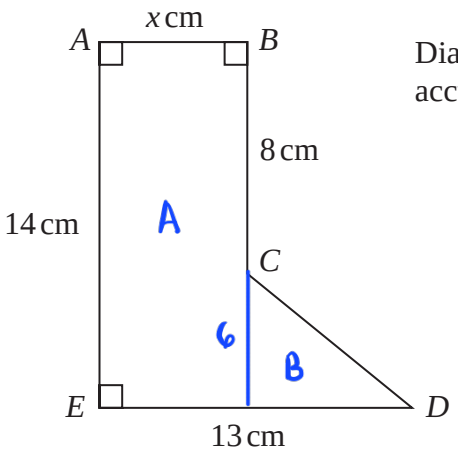


Diagram **NOT** accurately drawn

The diagram shows the shape *ABCDE*.

The area of the shape is 91.8 cm²

Work out the value of *x*.

Area of A = 14 cm × x cm

= 14x cm² (1)

Area of B = $\frac{1}{2}$ × 6 cm × (13 − x) cm

= (39 − 3x) cm²

Area of shape = Area of A + Area of B

91.8 = 14x + 39 − 3x (1)

91.8 − 39 = 11x (1)

52.8 = 11x

$x = \frac{52.8}{11}$

= 4.8 (1)

$x =$ 4.8

(Total for Question 18 is 4 marks)

19 On a farm there are chickens, ducks and pigs.

The ratio of the number of chickens to the number of ducks is 7 : 2
The ratio of the number of ducks to the number of pigs is 5 : 9
There are 36 pigs on the farm.

Work out the number of chickens on the farm.

Finding number of ducks :

$\frac{36}{9} \times 5 = 20$ ducks (1)

Finding number of chickens :

$\frac{20}{2} \times 7 = 70$ chickens

(1) (1)

70

(Total for Question 19 is 3 marks)

20 (a) Expand and simplify $3x(2x + 3) - x(3x + 5)$

$6x^2 + 9x - 3x^2 - 5x$ (1)

$6x^2 - 3x^2 + 9x - 5x$

$3x^2 + 4x$ (1)

$3x^2 + 4x$

(2)

(b) Make t the subject of the formula $p = at - d$

$p = at - d$

$p + d = at$ (1)

$t = \frac{p+d}{a}$ (1)

$t = \frac{p+d}{a}$

(2)

Given that $\frac{w^5 \times w^n}{w^3} = w^{10}$

(c) work out the value of n.

$w^{5+n-3} = w^{10}$

$5 + n - 3 = 10$ (1)

$n + 2 = 10$

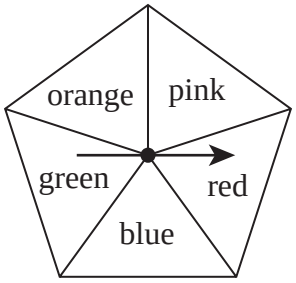
$n = 8$ (1)

$n =$ 8

(2)

(Total for Question 20 is 6 marks)

21 Grace has a biased 5-sided spinner.



Grace is going to spin the arrow on the spinner once.

The table below gives the probabilities that the spinner will land on red or on blue or on green.

Colour	Red	Blue	Green	Orange	Pink
Probability	0.20	0.12	0.08	0.45	0.15

The probability that the spinner will land on orange is 3 times the probability that the spinner will land on pink.

(a) Work out the probability that the spinner will land on orange.

Probability of the spinner landing on orange or pink :

$1 - 0.20 - 0.12 - 0.08$

$= 0.60$ (1)

$P(O) = 3P(p)$

$\frac{3}{4}(0.60) = 0.45$ (1) (1)

0.45

(3)

Grace spins the arrow on the spinner 150 times.

(b) Work out an estimate for the number of times the spinner lands on blue.

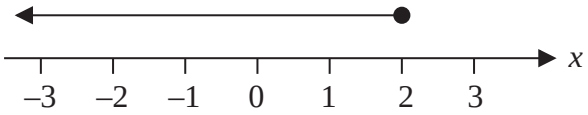
$0.12 \times 150 = 18$ (1) (1)

18

(2)

(Total for Question 21 is 5 marks)

22 (a)



Write down the inequality shown on the number line.

$x \leqslant 2$ (1)

(1)

$-4 \leqslant 2y < 6$

y is an integer.

(b) Write down all the possible values of y.

$-4 \leqslant 2y < 6$ $\div 2$

$-2 \leqslant y < 3$

$-2, -1, 0, 1, 2$ (2)

(2)

(c) Solve the inequality $7t - 3 \leqslant 2t + 31$

Show your working clearly.

$7t - 3 \leqslant 2t + 31$

$7t - 2t \leqslant 31 + 3$

$5t \leqslant 34$ (1)

$t \leqslant \frac{34}{5}$

$t \leqslant 6.8$ (1)

$t \leqslant 6.8$

(2)

(Total for Question 22 is 5 marks)

23 The table shows the populations of five countries.

Country	Population
China	1.4×10^9
Germany	8.2×10^7
Sweden	9.9×10^6
Fiji	9.1×10^5
Malta	4.3×10^5

(a) Work out the difference between the population of China and the population of Germany.
Give your answer in standard form.

China : $1.4 \times 10^9 = 140 \times 10^7$

Difference : $140 \times 10^7 - 8.2 \times 10^7$ (1)

$= (140 - 8.2) \times 10^7$

$= 131.8 \times 10^7$

$= 1.32 \times 10^9$ (1)

1.32×10^9

(2)

Given that

$$\text{population of Fiji} = \frac{1}{k} \times \text{population of Sweden}$$

(b) work out the value of k.
Give your answer correct to the nearest whole number.

Fiji : 9.1×10^5

Sweden : $9.9 \times 10^6 = 99 \times 10^5$

$9.1 \times 10^5 = \frac{1}{k} \times 99 \times 10^5$

$k = \frac{99 \times 10^5}{9.1 \times 10^5}$ (1)

$= 11$ (1)

$k =$ 11

(2)

(Total for Question 23 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

24 (a) Factorise fully $25a^4c^7d + 45a^9c^3h$

(2) $5a^4c^3(5c^4d + 9a^5h)$

(2)

(b) Solve $(2x + 5)^2 = (2x + 3)(2x - 1)$

$4x^2 + 20x + 25 = 4x^2 - 2x + 6x - 3$

$4x^2 + 20x + 25 = 4x^2 + 4x - 3$ (1)

$4x^2 - 4x^2 + 20x - 4x + 25 + 3 = 0$

$16x + 28 = 0$

$16x = -28$ (1)

$x = \frac{-28}{16}$

$= -1.75$ (1)

$x =$ -1.75

(3)

(Total for Question 24 is 5 marks)

25 Jethro has sat 5 tests.
Each test was marked out of 100 and Jethro's mean mark for the 5 tests is 74

Jethro has to sit one more test that is also to be marked out of 100

Jethro wants his mean mark for all 6 tests to be at least 77

Work out the least mark that Jethro needs to get for the last test.

Jethro's total marks for 5 tests :

$74 \times 5 = 370$ (1)

To get mean marks of 77 or more :

$\frac{370 + x}{6} = 77$ x : mark for 6th test

$370 + x = 77 \times 6$

$370 + x = 462$ (1)

$x = 462 - 370 = 92$ (1)

92

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

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