Please check the examination details below before entering your candidate information

Candidate surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

Time 1 hour 30 minutes

Paper reference **1MA1/2F**

Mathematics

PAPER 2 (Calculator)
Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator, Formulae Sheet (enclosed). 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.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **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.

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.
- Try to answer every question.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ▶

P66304A

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Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

.CG Maths.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 1476 to the nearest 10

The 7 is in the tens place. The 6 after it causes it to round up to an 8 then everything after the tens is set to 0

1480

(Total for Question 1 is 1 mark)

2 Write a fraction in the box to make the calculation correct.

$1 - \frac{3}{10} =$ $\frac{7}{10}$

Typing 1 - 3/10 into the calculator gives the fraction 7/10

(Total for Question 2 is 1 mark)

3 Here is a list of numbers.

3 3 3 3 4 4 5 7 8

Write down the mode of the numbers.

3 appears 4 times. 4 appears 2 times. 5, 7 and 8 each appear 1 time. 3 appears the most so it is the mode

3

(Total for Question 3 is 1 mark)

4 Write down a 3 digit number that is a multiple of 5

100 has 3 digits and ends in a 0 so is a multiple of 5. Numbers ending in a 5 or 0 are multiples of 5 as they are in the 5 times table

100

(Total for Question 4 is 1 mark)

5 Write 0.4 as a percentage.

0.4 x 100 = 40 ← Multiplying any decimal by 100 converts it into a percentage

40 %

(Total for Question 5 is 1 mark)

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6 Write the following numbers in order of size.
Start with the smallest number.

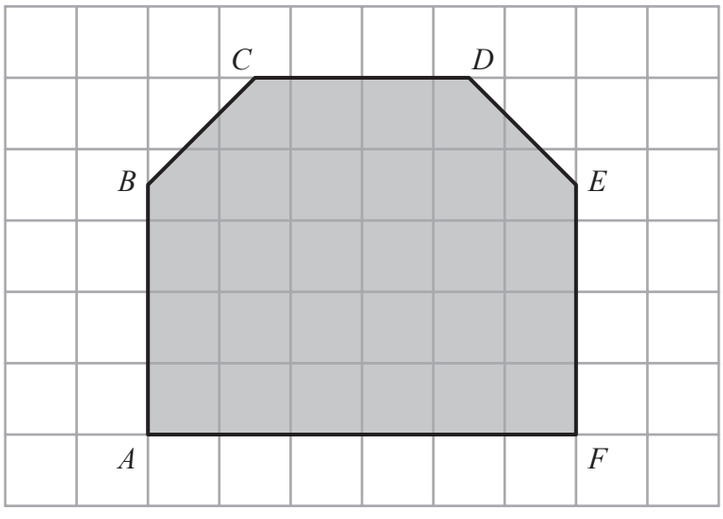
−11 −2 8 −7 3 10

The more negative a number, the smaller it is. The less positive a number, the smaller it is. Negative numbers are smaller than positive numbers

-11, -7, -2, 3, 8, 10

(Total for Question 6 is 1 mark)

7 Here is polygon *ABCDEF* on a square grid.



(a) Write down the mathematical name of the polygon.

It has 6 straight sides

Hexagon

(1)

(b) Which side of the polygon is parallel to the side *CD*?

It is parallel as it it goes in the same direction, has the same gradient and will never meet when extended forever

AF

(1)

(c) Write down a side of the polygon that is perpendicular to the side *AF*.

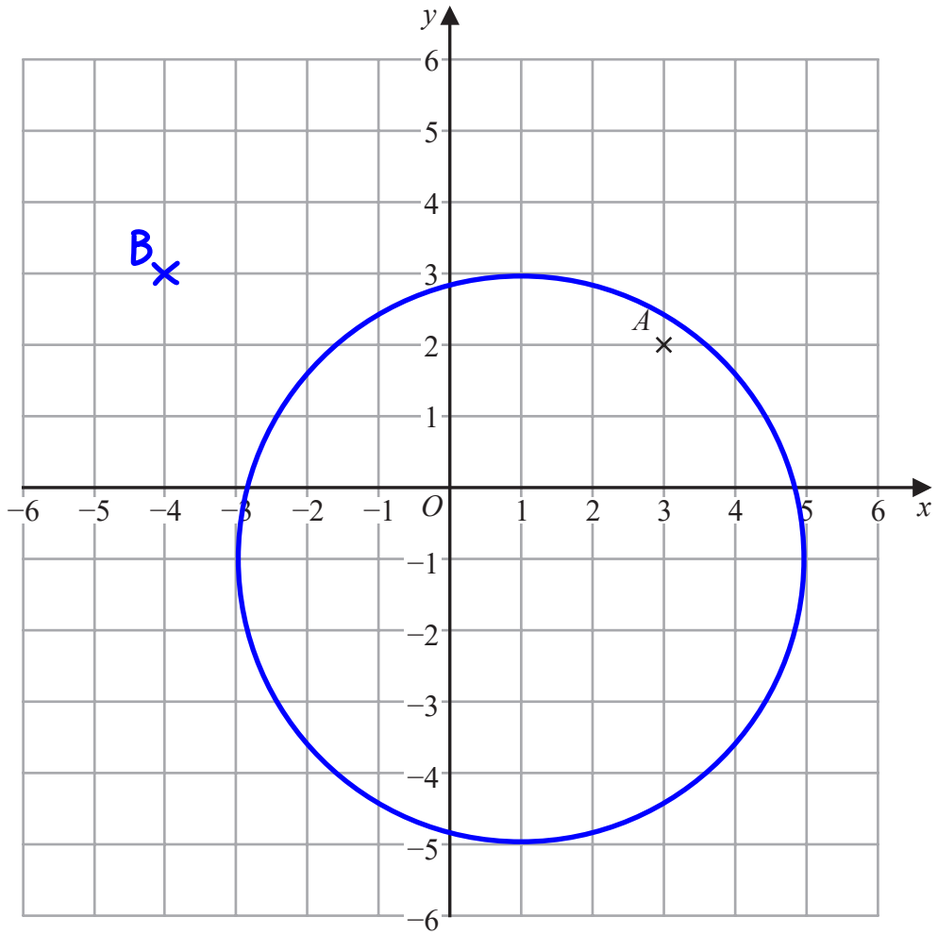
It is perpendicular as it is at right angles to side AF

AB

(1)

(Total for Question 7 is 3 marks)

8 Here is a centimetre grid.



(a) Write down the coordinates of point A.

(x-coordinate , y-coordinate)

(3 , 2)

(1)

(b) On the grid, mark with a cross (×) the point with coordinates (−4, 3)
Label this point B.

(x-coordinate , y-coordinate)

(1)

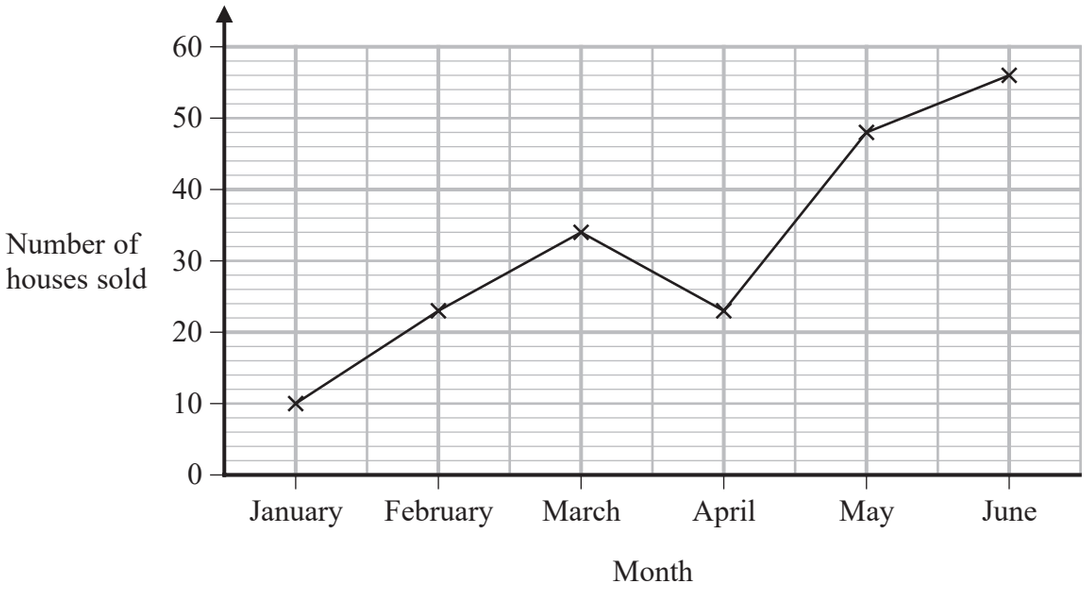
(c) On the grid, draw the circle with
centre (1, −1)
and radius 4 cm.

Put the needle of the compass in at (1 , -1), set the radius to 4cm and draw a circle

(2)

(Total for Question 8 is 4 marks)

9 The graph shows information about the number of houses sold by an estate agent in each of six months last year.



(a) How many houses were sold by the estate agent in February?

The scale goes up 10 over 5 boxes. 10 ÷ 5 = 2, so each box is worth 2. Half a box is worth 1. It is 1.5 boxes above 20 for February and these boxes represent 3 as 1.5 x 2 = 3. 3 above 20 is 23

23

(1)

(b) For this estate agent, write down the ratio of the number of houses sold in January to the number of houses sold in June.

10 were sold in January and 56 were sold in June. The ratio does not need to be simplified

10:56

(2)

(Total for Question 9 is 3 marks)

10 Sonia wants to book a holiday.
The holiday will cost £1428

Sonia will pay a deposit of £150
She will then pay the rest of the cost in 6 equal monthly payments.

How much is each monthly payment?

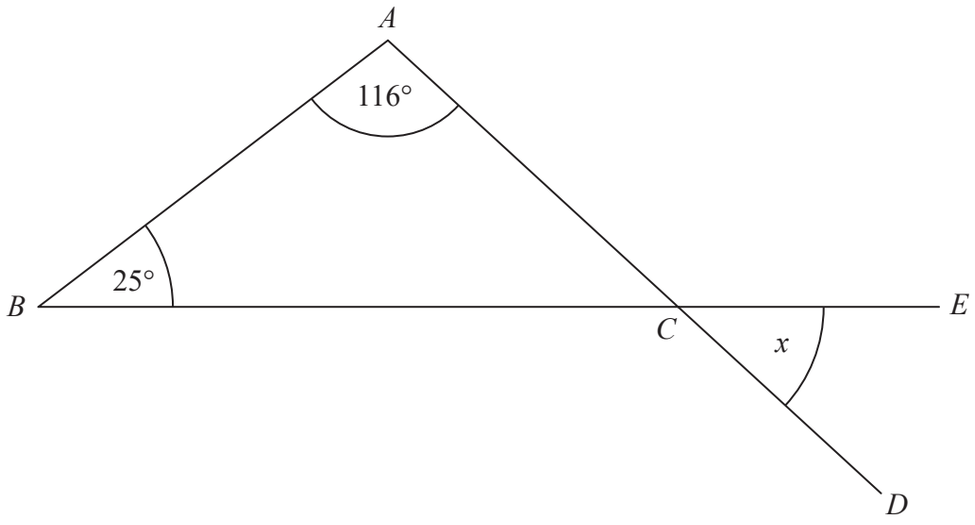
1428 − 150 ← Subtracting the deposit from the total cost leaves the cost of the 6 equal monthly payments

1278 ÷ 6 ← Dividing the cost of the 6 equal monthly payments by 6 works out how much each monthly payment is

£ 213

(Total for Question 10 is 3 marks)

11 The diagram shows a triangle *ABC*.



ACD and *BCE* are straight lines.

Work out the size of the angle marked *x*.
Give a reason for each stage of your working.

180 - 25 - 116
Angle ACB = 39° as angles in a triangle add up to 180°

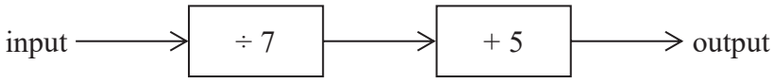
Angle x = 39° as vertically opposite angles are equal

Subtracting the other angles in the triangle away from 180 leaves angle ACB

39 °

(Total for Question 11 is 3 marks)

12 Here is a number machine.



(a) Work out the output when the input is 28

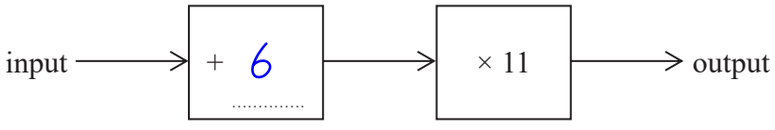
28 ÷ 7
4 + 5

First dividing by 7 then adding 5

9

(1)

Here is a different number machine.
The number machine is not complete.



When the input is 8, the output is 154

(b) Complete the number machine.

(2)

154 ÷ 11

Starting from the output and going backward. The opposite operations need to be done in the opposite order. Dividing is the opposite of multiplying

14 − 8

Working out the difference between the input and the 14 it must be after the addition works out what needs to be added

(Total for Question 12 is 3 marks)

13 Sophie works in a bed shop.
During the last three months she sold 198 beds.

59 beds were sold without a mattress.
45 beds were double beds.
17 of the single beds were sold without a mattress.
67 of the 83 king size beds were sold with a mattress.

Use this information to complete the two-way table.

	Single	Double	King size	Total
With mattress	53	19	67	139
Without mattress	17	26	16	59
Total	70	45	83	198

Once the initial information is filled in, the missing number in each row or column can be found by considering that the row or column has to add up to the total at the end of it

198 - 59 = 139
83 - 67 = 16
198 - 45 - 83 = 70
70 - 17 = 53
139 - 53 - 67 = 19
45 - 19 = 26

(Total for Question 13 is 3 marks)

14 The box below contains three mathematical symbols.

=	<	>

From the box, choose a symbol to make each of the following statements correct.

(i) $\frac{5}{8}$ ..... > ..... $\frac{2}{8}$ ← Both denominators are the same so the fraction with the greatest numerator is greatest **(1)**

(ii) -2×-3 ..... = ... $-3 + 9$ ← -2 x -3 = 6, -3 + 9 = 6 **(1)**

(Total for Question 14 is 2 marks)

15 The table shows information about the number of social media accounts used by each of 300 students.

Number of social media accounts		Frequency		
0	×	3	=	0
1	×	57	=	57
2	×	84	=	168
3	×	75	=	225
4	×	81	=	324

(a) Work out the total number of social media accounts used by these students.

Multiplying the number by the frequency works out the total number for each category. Adding all of these totals gives the total number

0 + 57 + 168 + 225 + 324 = 774

774

(2)

(b) Find the median number of social media accounts used by these students.

$\frac{300+1}{2}$ ← Using the formula (n + 1)/2, where n is the total number of students, works out that the median value is the 150.5th value, or halfway between the 150th and 151st

150.5 − 3
147.5 − 57
90.5 − 84
6.5

Counting the frequencies in order until no more can be counted. This finds that the 150th and 151st are both 3 social media accounts

3

(2)

(Total for Question 15 is 4 marks)

16 On a scale drawing, a building has length 12.4 cm and width 9.4 cm.
The real length of the building is 62 metres.

Work out, in metres, the real width of the building.

62 ÷ 12.4 ← 62m is represented by 12.4cm. Dividing the 62m by the 12.4cm works out that each centimetre represents 5 metres

5 × 9.4 ← Multiplying what each centimetre represents by the number of centimetres representing the width works out the actual width

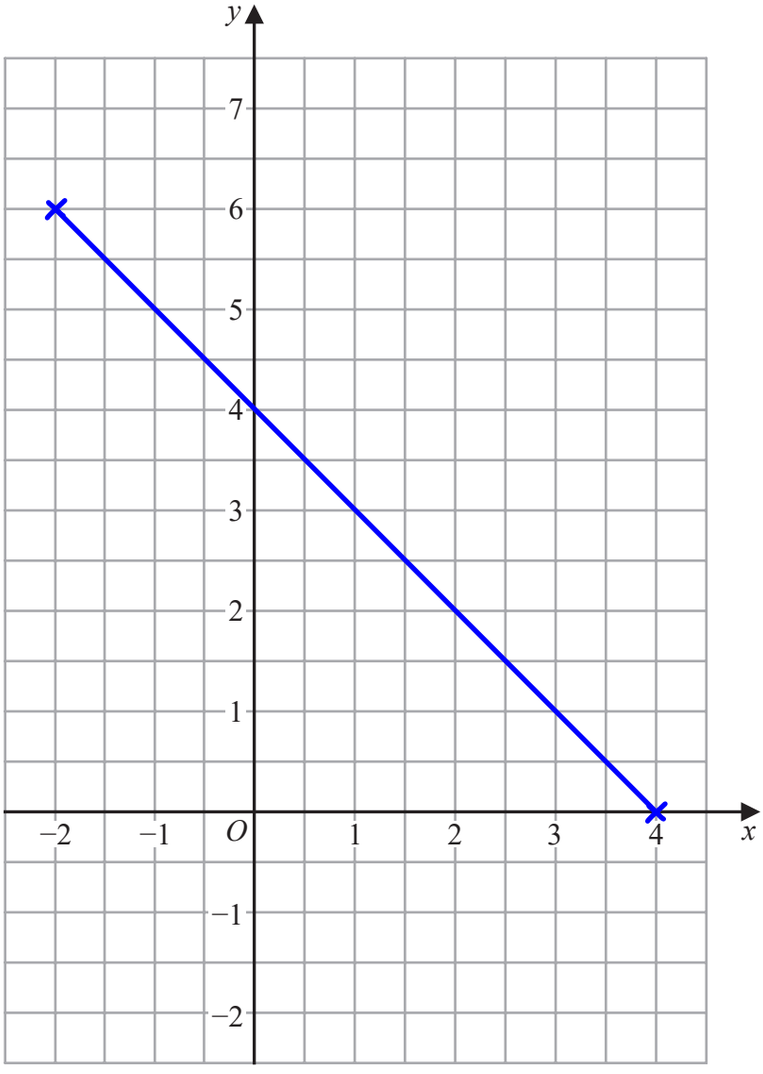
47 metres

(Total for Question 16 is 3 marks)

17 On the grid below, draw the graph of $y = 4 - x$ for values of x from -2 to 4

$y = 4-(-2) = 6$ ← When x = -2, y = 6. So the coordinate (-2 , 6) can be plotted

$y = 4-(4) = 0$ ← When x = 4, y = 0. So the coordinate (4 , 0) can be plotted



(Total for Question 17 is 3 marks)

It is a straight line so plotting the first and last point and connecting them together completes the graph

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18 This sign was in a doctor's waiting room.

> 115 appointments were missed last month.
>
> These missed appointments were a total of 25.3 hours.

Work out the mean length of time for each missed appointment.
Give your answer in minutes.

25.3×60 ← There are 60 minutes in an hour so multiplying the number of hours by 60 converts it into minutes

1516÷115 ← Mean = total ÷ number, where total is the total amount of time and number is the number of appointments

13.2 minutes

(Total for Question 18 is 3 marks)

19 Nimra buys a 3 kg box of sweets for £17.60

She puts the sweets into bags to sell.
Each bag contains 150 g of sweets.

Nimra fills as many bags as possible.
She will sell each bag for the same price.

Nimra wants to make a profit of at least 35%

Assuming she sells all the bags,
what is the lowest price Nimra should charge for each bag?

3×1000 ← There are 1000g in 1kg so multiplying the mass of the box of sweets by 1000 converts it into grams

$3000 \div 150$ ← Dividing the mass of the box of sweets in grams by the mass in each bag in grams works out that there will be 20 bags

$17.60 \div 20$ ← Dividing the cost of all the sweets by the 20 bags works out that each bag costs £0.88

$0.88 \times \frac{100+35}{100}$ ← 100 + 35 expresses the percentage the price needs to increase to. Putting this over 100 converts the percentage to a fraction, which when multiplied by increases the £0.88 by 35%, and therefore works out the price they need to be sold for to make profit of exactly 35%

The price of £1.188 is rounded up to the nearest penny as it is a minimum price and the profit can be more than 35%

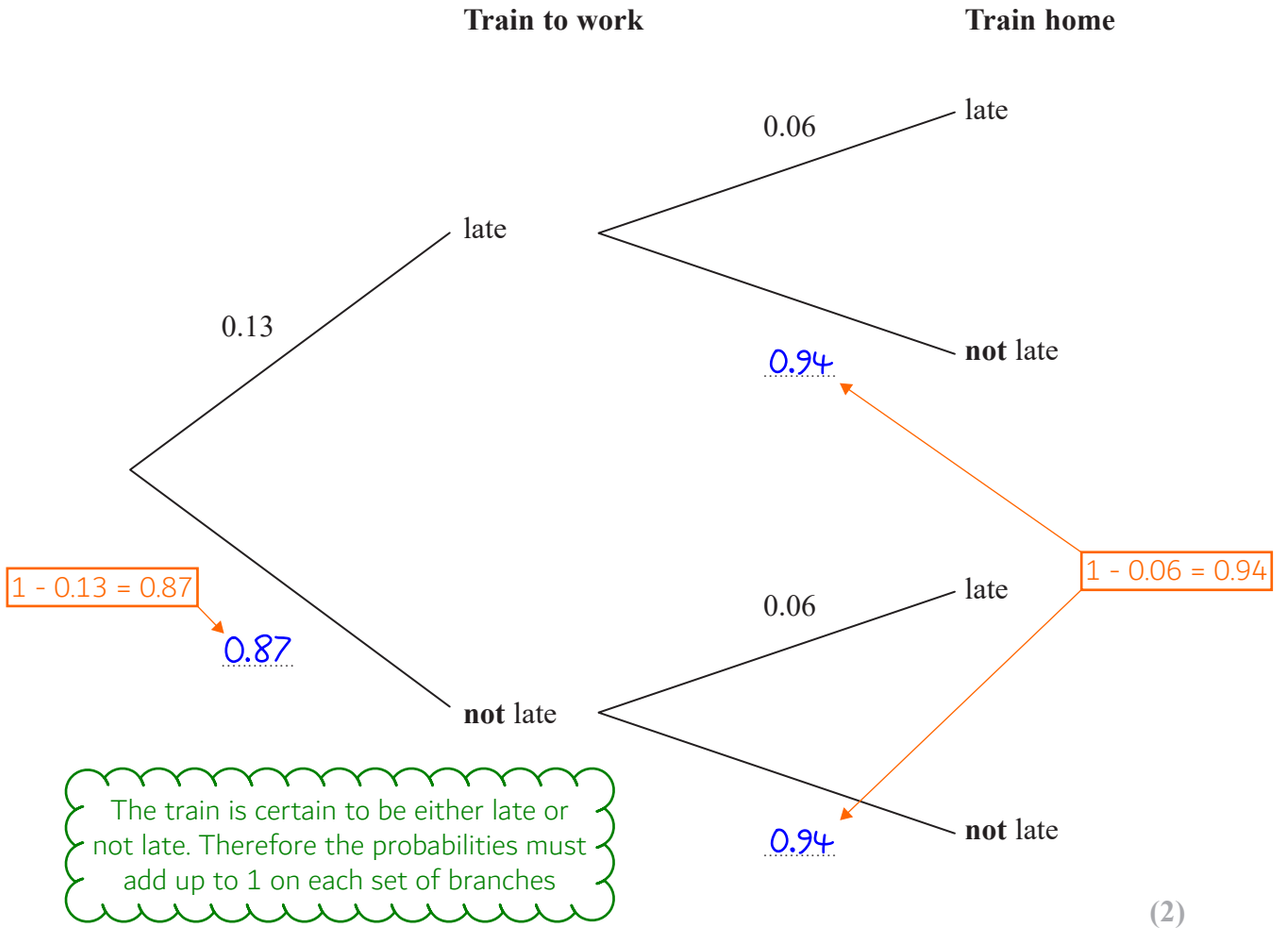
£ 1.19

(Total for Question 19 is 5 marks)

20 Lorena gets a train at the same time each morning to go to work.
She gets a train at the same time each evening to come home.

The probability tree diagram shows the probabilities of each train arriving late.

(a) Complete the probability tree diagram.



The train is certain to be either late or not late. Therefore the probabilities must add up to 1 on each set of branches

(2)

For a day that Lorena goes to work,

(b) work out the probability that the train to work and the train home will both arrive late.

0.13×0.06 ← Late AND late. AND means to multiply the probabilities

$\frac{39}{5000}$

(2)

(Total for Question 20 is 4 marks)

21 (a) Simplify $(x^3)^5$

$(a^x)^y = a^{xy}$. When raising a power to a power, multiply the powers

x^{15}

(1)

(b) Expand and simplify $4(x + 3) + 7(4 - 2x)$

$4x + 12 + 28 - 14x$ ← Expanding the brackets. 4 x x = 4x. 4 x 3 = 12. 7 x 4 = 28. 7 x -2x = -14x

Simplifying by collecting like terms. 4x - 14x = -10x. 12 + 48 = 40

$-10x + 40$

(2)

(c) Factorise fully $15x^3 + 3x^2y$

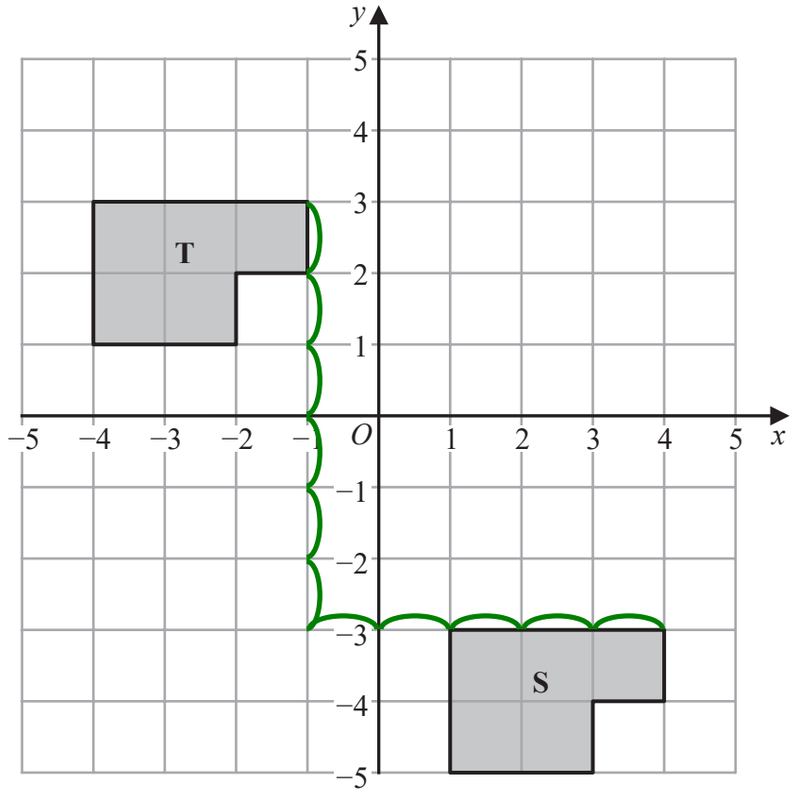
The highest common factor of both terms is $3x^2$. Bringing this out as a factor and dividing both terms by this, leaving the result in a bracket

$3x^2(5x + y)$

(2)

(Total for Question 21 is 5 marks)

22



Describe fully the single transformation that maps shape **S** onto shape **T**.

Translation by $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$

It must be a translation as it has been moved without changing size or the way up it is. Counting the jumps from one of the corners on S to the same corner on T. It is 5 jumps to the left, which is -5 in the x-direction. It is 6 jumps up, which is 6 in the y-direction

(Total for Question 22 is 2 marks)

23 The length of a football pitch is 90 metres, correct to the nearest metre.

Complete the error interval for the length of the football pitch.

$90 \pm \frac{1}{2}$ ← Adding and subtracting half of the resolution works out the upper and lower bound. The resolution is what the measurement can go up in or is to the nearest, which is 1m

89.5 m $\leqslant$ length $<$ 90.5 m

(Total for Question 23 is 2 marks)

24 Festival A will be in a rectangular field with an area of 80 000 m^2
The greatest number of people allowed to attend Festival A is 425

Festival B will be in a rectangular field 700 m by 2000 m.
The greatest number of people allowed to attend Festival B is 6750

The area per person allowed for Festival B is greater than the area per person allowed for Festival A.

(a) How much greater?
Give your answer correct to the nearest whole number.

$80000 \div 425 = \frac{3200}{17}$ ← This is the area per person for Festival A. Area per person means to divide the area by the number of people

2000×700 ← This is the area for Festival B. Area of rectangle = length x width

$1400000 \div 6750 = \frac{5600}{27}$ ← This is the area per person for Festival B. Area per person means to divide the area by the number of people

$\frac{5600}{27} - \frac{3200}{17}$ ← Subtracting the area per person of Festival A from the area per person for Festival B works out how much greater the area per person for Festival B is than Festival A

19.17... is rounded to the nearest whole metre

19 m^2

(4)

Callum says,

"300 cm^2 is the same as 3 m^2 because there are 100 cm in 1 m so you divide by 100"

Callum's method is wrong.

(b) Explain why.

Should divide by 100^2

There are 100cm in 1m, however the unit is squared so the amount needed to divide by to convert is also squared

(1)

(Total for Question 24 is 5 marks)

25 The points L, M and N are such that LMN is a straight line.

The coordinates of L are $(-3, 1)$

The coordinates of M are $(4, 9)$

Given that $LM : MN = 2 : 3$,

find the coordinates of N.

$4-(-3)$ ← This works out that the distance between L and M in the x-direction is 7

$7 \div 2$ ← 2 parts of the ratio represent the distance between L and M. Dividing the 7 by 2 works out that 1 part of the ratio is worth 3.5 in the x-direction

3.5×3 ← Multiplying the value of 1 part by 3 works out that the 3 parts which represent the distance between M and N in the x-direction is 10.5

$4+10.5=14.5$ ← Adding the distance between M and N in the x-direction to the x-coordinate of M works out the x-coordinate of N

$9-1$
$8 \div 2$
4×3
$9+12=21$ ← Doing the same method but for the y-direction

(14.5 , 21)

(Total for Question 25 is 4 marks)

26 A new phone cost £679
The value of the phone decreases at a rate of 4% per year.

Work out the value of the phone at the end of 3 years.

$679 \times \left(\frac{100-4}{100}\right)^3$ ← 100% is the full amount. Subtracting 4% works out the percentage it decreases to. Putting this over 100 converts it into a fraction, which reduces the £679 by 4% when it is multiplied by. Raising the fraction to the power of 3 as it needs to be decreases by 4% 3 times

The answer of 600.735... is rounded to the nearest penny

£ 600.74

(Total for Question 26 is 3 marks)

27 In Spain, Sam pays 27 euros for 18 litres of petrol.
In Wales, Leo pays £40.80 for 8 gallons of the same type of petrol.

1 euro = £0.85
4.5 litres = 1 gallon

Sam thinks that petrol is cheaper in Spain than in Wales.

Is Sam correct?
You must show how you get your answer.

$27 \times 0.85 = 22.95$ ← Each euro is £0.85 so multiplying the 27 euros by 0.85 converts it to £22.95

$18 \div 4.5 = 4$ ← Every 4.5 litres is 1 gallon so dividing the 18 litres by 4.5 works out how many lots of 4.5 litres it is and therefore how many gallons it is

$22.95 \times 2 = 45.90$ ← 8 gallons is 2 lots of 4 gallons so multiplying the price of 4 gallons by 2 works out the price of 8 gallons

No ← The petrol in Spain is not cheaper than in Wales as it costs £45.90 for 8 gallons and Wales is less than this for 8 gallons

(Total for Question 27 is 4 marks)

28 Solve the simultaneous equations

$5x + 2y = 27$ ← First equation

$6x + 4y = 28$ ← Second equation

$10x+4y=54$ ← Multiplying the whole of the first equation by 2 so that the number of y is the same as in the second equation. This forms the third equation

$4x=26$ ← Subtracting the second equation from the third equation to eliminate the y term and get an equation just in terms of x

$x=6.5$ ← Dividing both sides by 4 finds x

$5\times6.5+2y=27$ ← Substituting the value of x into the first equation

$2y=27-5\times6.5$ ← Subtracting 5 x 6.5 from both sides to get the y term on its own

$y=\frac{27-5\times6.5}{2}$ ← Dividing both sides by 2 gets y on its own

$x =$ 6.5

$y =$ -2.75

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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