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Candidate surname

Other names

Centre Number

Candidate Number

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

**Monday 11 November 2024**

Morning (Time: 1 hour 30 minutes)

Paper  
reference

**1MA1/3F**

**Mathematics**

**Paper 3 (Calculator)**

**Foundation Tier**



**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB or B pencil, eraser, calculator, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

## Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **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.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  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.

Turn over ►

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**.CG Maths.**  
Worked Solutions



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 should be written in the exam.

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

If you find any mistakes or have any requests or suggestions, please send an email to [curtis@cgmaths.co.uk](mailto:curtis@cgmaths.co.uk)

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write down the value of the 7 in the number 3721

The 7 is in the hundreds place

700

(Total for Question 1 is 1 mark)

- 2 Work out  $\frac{1}{6}$  of 96

$\frac{1}{6} \times 96 = 16$

16

(Total for Question 2 is 1 mark)

- 3 Write down two factors of 16

$1 \times 16 = 16$ , so both 1 and 16 are factors of 16

1, 16

(Total for Question 3 is 1 mark)

- 4 Write the following numbers in order.  
Start with the lowest number.

The more negative a number is, the lower it is.  
The less positive a number is, the lower it is

-3    4    -7    6    0

-7, -3, 0, 4, 6

(Total for Question 4 is 1 mark)

- 5 Find the value of  $\sqrt{2.25}$

Typing it into the calculator

1.5

(Total for Question 5 is 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



6 (a) Solve  $x + x + x + x = 20$

$4x = 20$  ←  $x + x + x + x = 4x$

Dividing both sides by 4 eliminates the 4 on the left and gets x on its own

$x = \dots\dots\dots 5$   
(1)

(b) Solve  $y + 7 = 24$

Subtracting 7 from both sides eliminates the +7 on the left and gets y on its own

$y = \dots\dots\dots 17$   
(1)

(c) Solve  $\frac{w}{2} = 4$

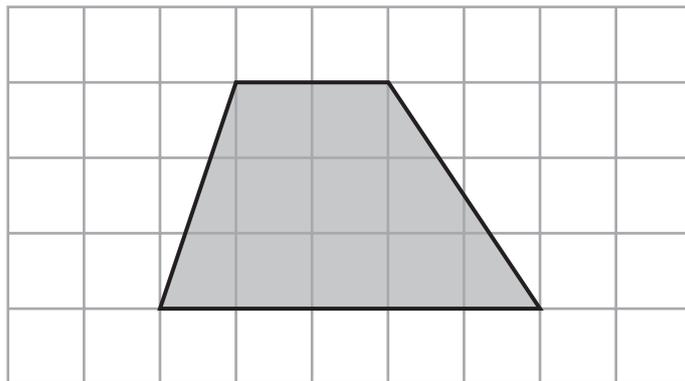
Multiplying both sides by 2 eliminates the 2 on the left and gets w on its own

$w = \dots\dots\dots 8$   
(1)

(Total for Question 6 is 3 marks)



7 Here is a quadrilateral.



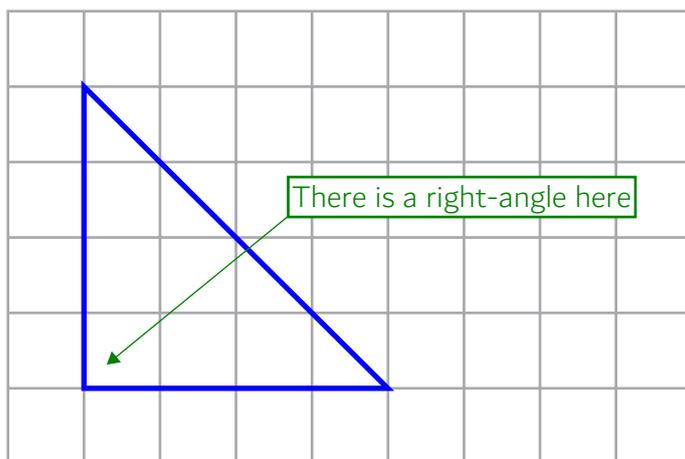
(a) Write down the special name for this quadrilateral.

A four-sided shape with one pair of parallel sides

Trapezium

(1)

(b) On the grid below, draw a right-angled triangle.



(1)

(Total for Question 7 is 2 marks)

- 8 Nina orders some items from a DIY shop.  
Here is her bill.

Item	Quantity	Cost of each item	Total
Pack of screws	4	£29.99	£119.96
Tin of paint	2	£24.95	£49.90
Wooden plank	30	£7.75	£232.50
Delivery charge			£14.95
<b>Total cost</b>			<b>£417.31</b>

- (a) Complete all the missing information in the bill.

$2 \times 24.95$

Multiplying the 2 tins of paint by the £24.95 cost of each tin works out that the total cost of the tins of paint is £49.90

$232.50 \div 7.75$

Dividing the £232.50 total cost of the wooden planks by the £7.75 cost of each plank works out that there were 30 wooden planks

$119.96 + 49.90 + 232.50 + 14.95$

Adding the total cost of each item and the delivery charge works out that the total cost is £417.31

(3)

At the beginning of January, Jeff had £892.48 in his bank account.

During January, Jeff

had £4.47 interest added to his account

paid £240 into his account

spent £365.50 from his account.

- (b) How much money did Jeff have in his account at the end of January?

$892.48 + 4.47 + 240 - 365.50$

Adding the £4.47 interest and the £240 paid into the account. Subtracting the £365.50 spent

£771.45

(3)

(Total for Question 8 is 6 marks)

9 There are 200 people at a party.

$\frac{2}{5}$  of the people are children.

The rest of the people are adults.

35% of the children are vegetarian.

45% of the adults are vegetarian.

How many of the people are **not** vegetarian?

$$\frac{2}{5} \times 200 = 80 \leftarrow \text{This works out } 2/5 \text{ of the people. So there are 80 children}$$

$$200 - 80 = 120 \leftarrow \text{Subtracting the 80 children from the 200 people works out that there are 120 adults}$$

$$\frac{35}{100} \times 80 = 28 \leftarrow \text{Putting the 35\% over 100 converts it to a fraction. Multiplying this by the 80 children works out that 28 of the children are vegetarian}$$

$$\frac{45}{100} \times 120 = 54 \leftarrow \text{Putting the 45\% over 100 converts it to a fraction. Multiplying this by the 120 adults works out that 54 of the adults are vegetarian}$$

$$200 - 28 - 54 \leftarrow \text{Subtracting the 28 children who are vegetarian and the 54 adults who are vegetarian from the 200 people works out that 118 of the people are not vegetarian}$$

118

(Total for Question 9 is 5 marks)



10 Here is part of a train timetable between Horwich and Manchester.

Horwich	07 13	07 46	08 14	08 44	09 14
Lostock	07 16		08 17		09 17
Bolton	07 21	07 54	08 22	08 52	09 22
Salford	07 36	08 05	08 36	09 05	09 36
Manchester	07 47	08 15	08 45	09 15	09 45

(a) How long should the 07 46 train from Horwich take to get to Salford?

$$08^{\circ}05^{\circ} - 07^{\circ}46^{\circ}$$

The 07 46 train from Horwich arrives in Salford at 08 05.  
Subtracting these times in the calculator by entering them as sexagesimals gives  $0^{\circ}19'0''$ , which can be read as 19 minutes

..... 19 ..... minutes  
(1)

Barnie has a job interview in Manchester.

Barnie takes 6 minutes to walk from his home to the station in Lostock.

He will take 8 minutes to walk from the station in Manchester to his interview.

Barnie needs to be at the interview no later than 09 00

(b) (i) What is the latest time Barnie can leave his house and be on time for the interview?

$$09^{\circ}00^{\circ} - 0^{\circ}8^{\circ}$$

Subtracting the 8 minutes from the 09 00 works out that the latest he can arrive in Manchester is 08 52. Entering the times into the calculator as sexagesimals gives  $8^{\circ}52'0''$

$$08^{\circ}17^{\circ} - 0^{\circ}6^{\circ}$$

08 45 is the latest time before 08 52 to arrive in Manchester. Reading up from here on the timetable finds that this train leaves Lostock at 08 17. Subtracting the 6 minutes from 08 17 works out that the latest time he can leave his house is 08 11. Entering the times into the calculator as sexagesimals gives  $8^{\circ}11'0''$

..... 08 11 .....  
(3)

The time of Barnie's interview is changed.

Now he has to be at the interview no later than 09 15

(ii) What effect does the change of time have on the latest time Barnie can leave his house?

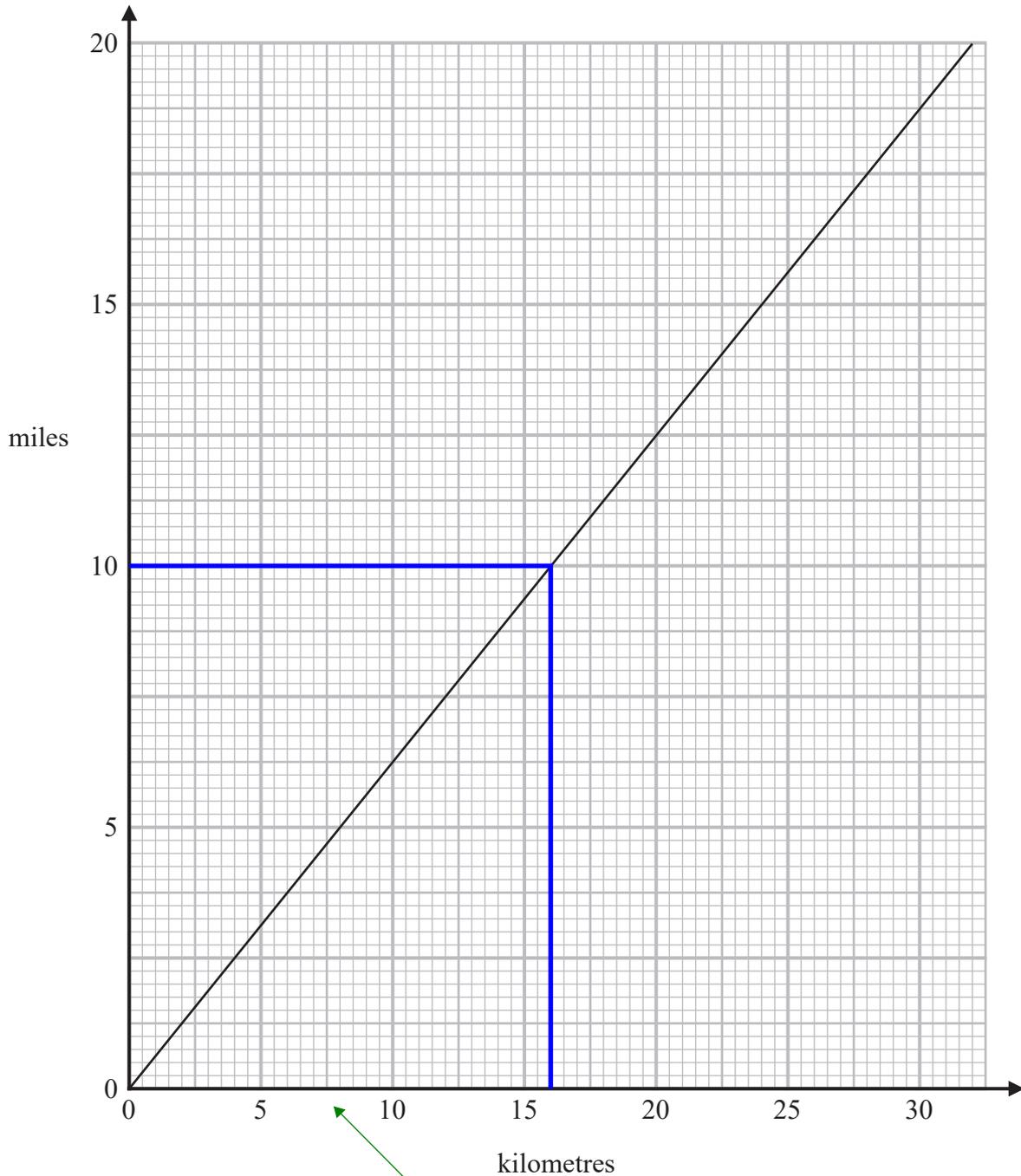
None

The next train from Lostock to Manchester leaves at 09 17. This is too late. So he still needs to catch the train at 08 17 from Lostock meaning that there is no effect on the latest time leaving his house

(1)

(Total for Question 10 is 5 marks)

11 You can use this graph to change between miles and kilometres.



(a) Change 10 miles into kilometres.

This scale goes up 5 over 10 small boxes.  $5 \div 10 = 0.5$ , so each small box is worth 0.5 and two small boxes is worth 1

Reading across from 10 miles to the line then down converts it to 16 kilometres

.....16..... kilometres  
(1)



Rob drives 17 miles from Bridlington to Scarborough.  
He then drives 50 kilometres from Scarborough to Staithes.

- (b) What is the total distance Rob drives?  
Give your answer in miles.

$$\frac{10}{16} \times 50$$

From part (a), 10 miles was 16 kilometres. Dividing the 10 miles by 16 expresses how many miles are in 1 kilometre then multiplying this by 50 finds that 50 kilometres is 31.25 miles

$$17 + 31.25$$

Adding the 31.25 miles from Scarborough to Staithes to the 17 miles from Bridlington to Scarborough works out that the total distance in miles is 48.25 miles

..... 48.25 ..... miles  
(3)

(Total for Question 11 is 4 marks)

- 12 A shop sells apples and oranges.

There are 6 apples in each pack of apples.  
There are 7 oranges in each bag of oranges.

The shop sells  $x$  packs of apples and  $y$  bags of oranges.

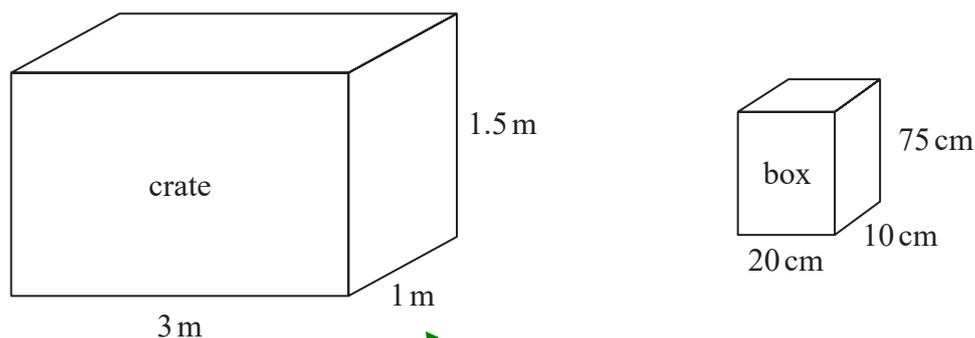
Write an expression, in terms of  $x$  and  $y$ , for the total number of apples and oranges the shop sells.

Multiplying the 6 apples in each pack by the  $x$  packs of apples gives a total of  $6x$  apples.  
Multiplying the 7 oranges in each bag by the  $y$  bags of oranges gives a total of  $7y$  oranges.  
Adding the  $6x$  apples and the  $7y$  oranges expresses the total number of apples and oranges

.....  $6x + 7y$  .....

(Total for Question 12 is 2 marks)

13 The diagram shows a crate and a box.



The crate is 3 m by 1 m by 1.5 m.  
The crate is completely filled with boxes.  
Each box is 20 cm by 10 cm by 75 cm.

There are 100 cm in 1 m. Multiplying each of the lengths in metres by 100 converts them to centimetres

Work out the number of boxes in the crate.

$$300 \div 20 = 15$$

Dividing the 300 cm length of the crate by the 20 cm length of each box works out that 15 boxes can fit along the length of the crate

$$100 \div 10 = 10$$

Dividing the 100 cm width of the crate by the 10 cm width of each box works out that 10 boxes can fit along the width of the crate

$$150 \div 75 = 2$$

Dividing the 150 cm height of the crate by the 75 cm height of each box works out that 2 boxes can fit along the height of the crate

$$15 \times 10 \times 2$$

Multiplying the 15 boxes along the length, the 10 boxes along the width and the 2 boxes along the height works out that there are 300 boxes in the crate

300

(Total for Question 13 is 4 marks)

14 Harry works in a shop.  
From Monday to Friday his basic rate of pay is £8 per hour.

On Saturday and Sunday, Harry's rate of pay is  $1\frac{1}{2}$  times his basic rate of pay.

The table shows the number of hours Harry worked each day last week.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Hours worked	6	6	6	6	6	4	3

Work out Harry's total pay last week.

$6 \times 5 = 30$  ← This works out that the total number of hours worked from Monday to Friday is 30 hours. There are 5 lots of 6 hours

$4 + 3 = 7$  ← This works out that the total number of hours worked on Saturday and Sunday is 7 hours

$30 \times 8 = 240$  ← Multiplying the 30 hours worked from Monday to Friday by the £8 per hour works out that he is paid £240 for Monday to Friday

$8 \times 1\frac{1}{2}$  ← This works out that his rate of pay is £12 per hour for Saturday and Sunday

$7 \times 12$  ← Multiplying the 7 hours worked from Saturday to Sunday by the £12 per hour works out that he is paid £84 for Saturday and Sunday

$240 + 84$  ← Adding the £240 for Monday to Friday and the £84 for Saturday and Sunday works out that he is paid £324 last week

£..... 324 .....

(Total for Question 14 is 4 marks)

15 The table gives information about the ages of the 41 children in Blackrod football club.

Age (years)		Frequency	
8	×	6	= 48
9	×	7	= 63
10	×	15	= 150
11	×	11	= 121
12	×	2	= 24
			<hr/>
			406 ÷ 41

← A

← B

- (a) Work out the mean age.  
Give your answer correct to 1 decimal place.

A: Multiplying the age for each category by the frequency works out the total age of all the children in each category.

B: Adding all these totals works out that the overall total age of all the children is 406 years. Dividing this by the 41 children works out that the mean is 9.90... years

9.90... is rounded to 1 decimal place

..... 9.9 ..... years  
(3)

Rohan is working out the modal age of the children in Blackrod football club.  
He says,

“The highest frequency is 15, so the modal age is 15”

- (b) Is Rohan’s answer correct?  
Give a reason for your answer.

No. The modal age is 10

15 is not one of the ages. It is a frequency. But as this is the highest frequency, the modal age is 10 years

(1)

(Total for Question 15 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

16 (a) Write 126 as a product of its prime factors.

This can be done using the calculator

$$2 \times 3^2 \times 7$$

(2)

(b) Find the highest common factor (HCF) of 126 and 210

$210 = 2 \times 3 \times 5 \times 7$  ← Expressing 210 as a product of its prime factors using the calculator

$2 \times 3 \times 7$  ← The HCF is the lowest power of each prime in both lists multiplied together

This method is not needed if using a newer Casio calculator which can work out the HCF of two numbers

$$42$$

(2)

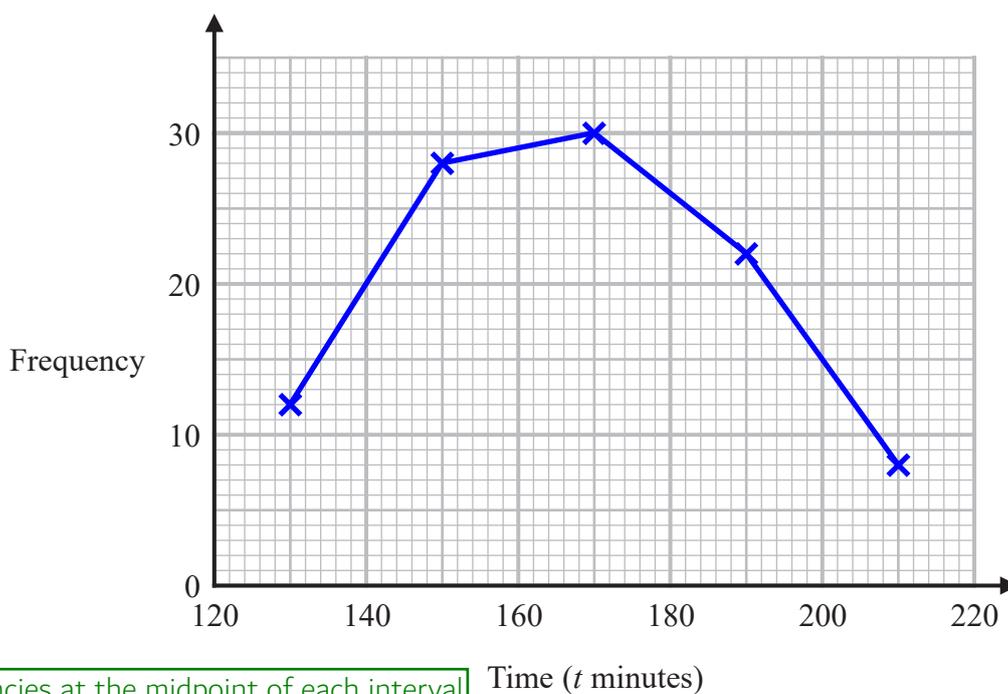
(Total for Question 16 is 4 marks)



17 The table shows information about the times, in minutes, 100 people took to complete a bike race.

Time ( $t$ minutes)	Frequency
$120 \leq t < 140$	12
$140 \leq t < 160$	28
$160 \leq t < 180$	30
$180 \leq t < 200$	22
$200 \leq t < 220$	8

On the grid below, draw a frequency polygon for this information.



Plotted the frequencies at the midpoint of each interval then joined them up with a series of straight lines

(Total for Question 17 is 2 marks)

18 (a) Write  $3.402 \times 10^5$  as an ordinary number.

It can be put into the calculator and it will convert it to an ordinary number

340200

(1)

(b) Write 0.8026 in standard form.

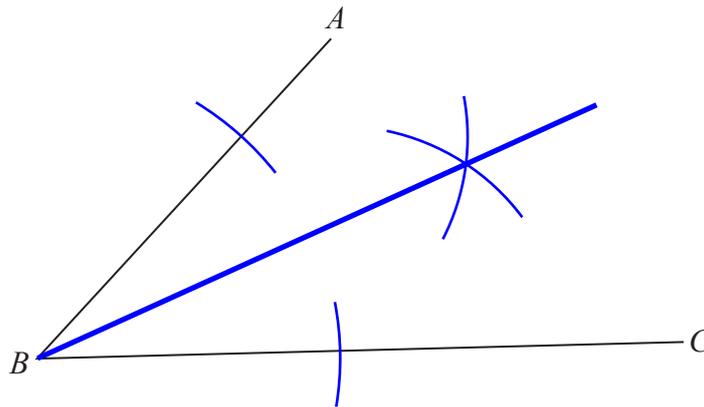
Standard form is  $a \times 10^n$ , where  $1 \leq a < 10$  and  $n$  is an integer. Multiplying 0.8026 by ten 1 time gives 8.026, which is at least 1 and less than 10. So  $a$  is 8.026. This must be divided by ten 1 time to keep it equal to the original 0.8026 so it is multiplied by  $10^{-1}$

$8.026 \times 10^{-1}$

(1)

(Total for Question 18 is 2 marks)

19 Use ruler and compasses to construct the bisector of angle  $ABC$ .  
You must show your construction lines.



(Total for Question 19 is 2 marks)

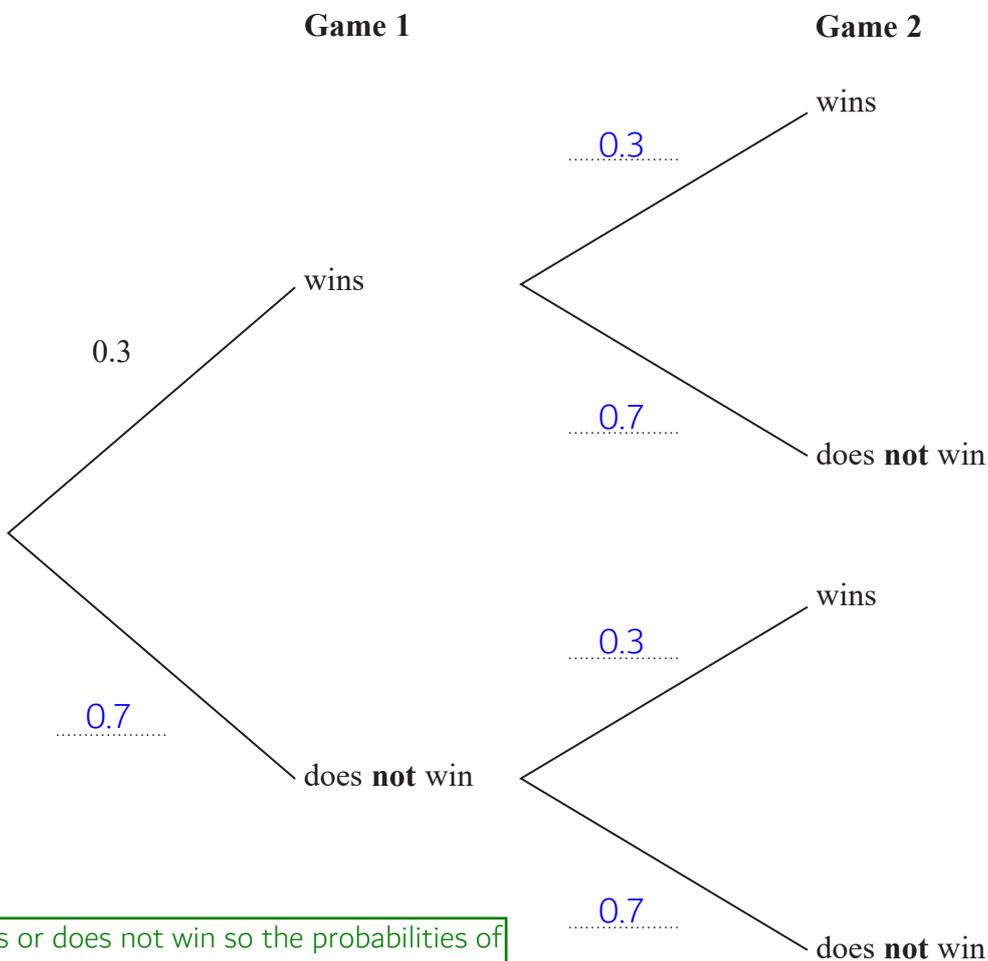
Putting the needle of the compass in at B and scribing an arc on AB and an arc on BC using the same radius. Then scribing arcs from these two arcs which form a cross. Drawing a straight line from B through this cross

20 Dan is playing cards.

The probability that he will win a game of cards is 0.3

Dan plays two games of cards.

(a) Complete the probability tree diagram.



He either wins or does not win so the probabilities of both events must add to 1. Subtracting the 0.3 from 1 gives 0.7, which is the probability of not winning

(2)

(b) Work out the probability that Dan does not win either game.

$0.7 \times 0.7$  ← Does not win AND does not win. AND means to multiply the probabilities

0.49

(2)

(Total for Question 20 is 4 marks)



21 Robyn buys a total of 240 pens and pencils, where

$$\text{number of pens} : \text{number of pencils} = 3 : 5$$

Robyn pays 9p for each pen.  
She sells each pen for 11p.

Robyn pays 6p for each pencil.  
She sells each pencil for 10p.

Robyn sells all of the pens and pencils.

Work out Robyn's percentage profit.  
Give your answer correct to 1 decimal place.  
You must show all your working.

$$240 \div 8$$

$3 + 5 = 8$  parts in total in the ratio which represent the total of the pens and pencils. So dividing the 240 pens and pencils by 8 works out that 1 part of the ratio is worth 30

$$30 \times 3 = 90$$

Multiplying the value of 1 part of the ratio by the 3 parts representing the pens works out that there are 90 pens

$$30 \times 5 = 150$$

Multiplying the value of 1 part of the ratio by the 5 parts representing the pencils works out that there are 150 pencils

$$90 \times 9 = 810$$

Multiplying the 90 pens by the 9p for each pen works out that she pays 810p for the pens

$$150 \times 6 = 900$$

Multiplying the 150 pencils by the 6p for each pencil works out that she pays 900p for the pencils

$$810 + 900 = 1710$$

Adding the 810p for the pens and the 900p for the pencils works out that 1710p was paid for the pens and pencils

$$90 \times 11 = 990$$

Multiplying the 90 pens by the 11p each pen is sold for works out that she sells the pens for 990p

$$150 \times 10 = 1500$$

Multiplying the 150 pencils by the 10p each pencil is sold for works out that she sells the pencils for 1500p

$$990 + 1500$$

Adding the 990p for the pens and the 1500p for the pencils works out that the pens and pencils were sold for a total of 2490p

$$2490 - 1710$$

Subtracting the 1710p paid from the 2490p sold for works out that the profit was 780p

$$\frac{780}{1710} \times 100$$

Putting the 780p profit over the original 1710p paid expresses the profit as a fraction. Multiplying this by 100 converts it to a percentage

45.61...% is rounded to 1 decimal place

45.6%

(Total for Question 21 is 5 marks)

22 The stem and leaf diagram shows the test scores of 23 students from School A.

3	<u>0</u>
4	<u>1</u> <u>2</u> <u>4</u> <u>4</u> <u>5</u> <u>7</u>
5	<u>3</u> <u>4</u> <u>4</u> <u>6</u> <u>7</u> <u>8</u> <u>8</u> <u>9</u>
6	<u>0</u> <u>8</u> <u>8</u> <u>9</u> <u>9</u>
7	<u>1</u> <u>3</u> <u>9</u>

Key:

3 | 0 represents 30

23 students from School B did the same test.

Their median score was 56

The range of their scores was 47

Compare the distribution of the test scores of the students from School A with the distribution of the test scores of the students from School B.

School A had a range of 49, which is greater than the range of School B

$$\text{Range} = \text{largest} - \text{smallest} = 79 - 30 = 49$$

School A had a median of 57, which is greater than the median of School B

The data is already in order. Underlining from both ends until the one in the middle is found works out that the median for School A is 57

(Total for Question 22 is 4 marks)

- 23 Jana used her calculator to find the value of a number  $t$ .  
The answer on her calculator began 10.2

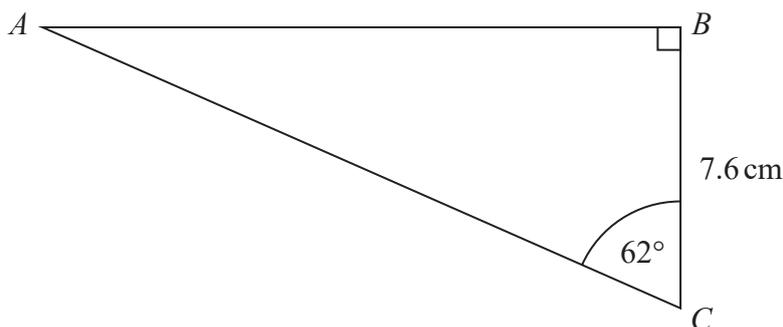
Complete the error interval for  $t$ .

The number must be at least 10.2 and less than 10.3

$$\dots\dots\dots 10.2 \dots\dots\dots \leq t < \dots\dots\dots 10.3 \dots\dots\dots$$

(Total for Question 23 is 2 marks)

- 24  $ABC$  is a right-angled triangle.



Calculate the length of  $AB$ .

Give your answer correct to 1 decimal place.

SOH CAH TOA

Using right-angled trigonometry so writing SOH CAH TOA as formula triangles. Ticking A as BC is the adjacent and ticking O as AB is the opposite. There are two ticks on the TOA formula triangle so this one can be used

$$\tan 62 \times 7.6$$

Covering O in the TOA formula triangle finds that opposite = tan of the angle  $\times$  adjacent

$$\dots\dots\dots 14.3 \dots\dots\dots \text{ cm}$$

(Total for Question 24 is 2 marks)

25 (a) Simplify fully  $2x^3y^5 \times 7x^2y$

$$2 \times 7 = 14 \text{ and } x^3 \times x^2 = x^5 \text{ and } y^5 \times y = y^6. a^w \times a^z = a^{w+z}$$

$$14x^5y^6$$

(2)

(b) Simplify  $(m^2)^{-3}$

$$(a^w)^z = a^{wz}$$

$$m^{-6}$$

(1)

(Total for Question 25 is 3 marks)

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DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

26 Peter invests £4500 in a savings account for 3 years.  
He gets 1.8% per year compound interest.

Work out the total amount of interest Peter gets.

$$\frac{100 + 1.8}{100}$$

Adding the 1.8% to 100% expresses the percentage which it increases to each year. Dividing this by 100 converts it to the decimal 1.018, which when multiplied by will increase by 1.8%

$$4500 \times 1.018^3$$

Multiplying the £4500 by 1.018 increases it by 1.8%. Raising the multiplier to the power of 3 as the £4500 needs to be increased by 1.8% 3 times. So there is £4747.40 in the account at the end of 3 years

$$4747.40 - 4500$$

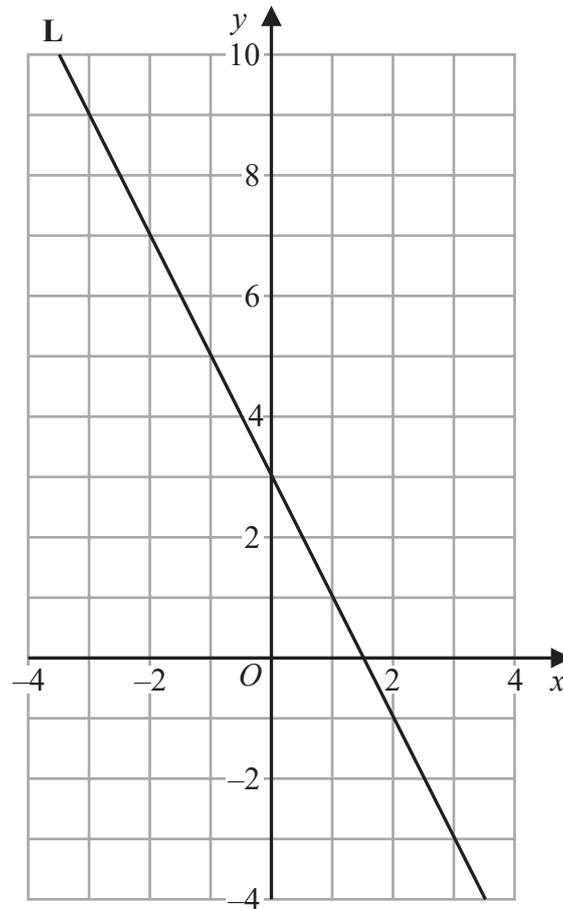
Subtracting the original £4500 from the £4747.40 works out that there was £247.40 interest

£..... 247.40 .....

(Total for Question 26 is 3 marks)



27 Line L is drawn on the grid.



Find an equation for line L.

The general equation of a straight line is  $y = mx + c$ , where  $m$  is the gradient and  $c$  is the y-intercept. The gradient is  $-2$  as every 1 the line goes to the right it goes down 2. The y-intercept is 3 as this is the y-coordinate where the line crosses the y-axis

$$y = -2x + 3$$

(Total for Question 27 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

