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 | | | | |

Monday 12 November 2018

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 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.
- 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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P55596A

6/7/7/7/1/

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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write a number in each box to make the calculation correct.

(i) 56.3 + 43.7 = 100

Subtracting the 56.3 from the 100 works out that the difference is 43.7 and this is what needs to be added

(1)

(ii) $\frac{2}{7}$ + $\frac{5}{7}$ = 1

Subtracting the 2/7 from the 1 works out that the difference is 5/7 and this is what needs to be added

(1)

(Total for Question 1 is 2 marks)

---

2 Write 3% as a fraction.

Percentage is out of 100

$\frac{3}{100}$

(Total for Question 2 is 1 mark)

---

3 Find $\sqrt{1.44}$

Type into the calculator

1.2

(Total for Question 3 is 1 mark)

---

4 Work out $\frac{1}{8}$ of 720

Of means to multiply. 1/8 × 720 = 90

90

(Total for Question 4 is 1 mark)

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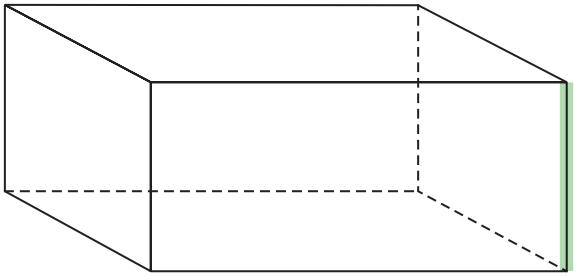
1/8 x 720

5 Here is a 3-D shape.



(a) Write down the name of this 3-D shape.

Cuboid

(1)

(b) Write down the number of edges of this 3-D shape.

Count them on the diagram

12

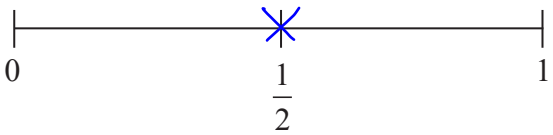
(1)

(Total for Question 5 is 2 marks)

6 An ordinary fair dice is thrown once. An ordinary fair dice has the numbers 1, 2, 3, 4, 5, 6

(a) On the probability scale below, mark with a cross (×) the probability that the dice lands on an odd number.

The odd possibilities are 1, 3 and 5. This is 3 numbers out of 6. 3/6 simplifies to 1/2



(1)

(b) Write down the probability that the dice lands on a number greater than 4

The numbers greater than 4 are 5 and 6. This is 2 numbers out of 6. There is no need to simplify the fraction

$\frac{2}{6}$

(1)

(Total for Question 6 is 2 marks)

7 Shaun is 1.88 m tall.

David is 6 cm taller than Shaun.

How tall is David?

1.88 × 100 ← 1 m = 100 cm. So multiplying the 1.88 m by 100 converts it to 188 cm

188 + 6 ← Adding the 6 cm to the 188 cm works out David's height in cm

194 cm

(Total for Question 7 is 2 marks)

8 2 pens cost £2.38
5 folders cost £5.60

Ben wants to buy 20 pens and 20 folders.
He only has £50

Does Ben have enough money to buy 20 pens and 20 folders?
You must show how you get your answer.

20 ÷ 2 ← Dividing the 20 pens by the 2 pens works out that 10 lots of the 2 pens are needed to get 20 pens

2.38 × 10 = 23.80 ← Multiplying the cost of 2 pens by 10 works out that the cost of 20 pens is £23.80

20 ÷ 5 ← Dividing the 20 folders by the 5 folders works out that 4 lots of the 5 folders are needed to get 20 folders

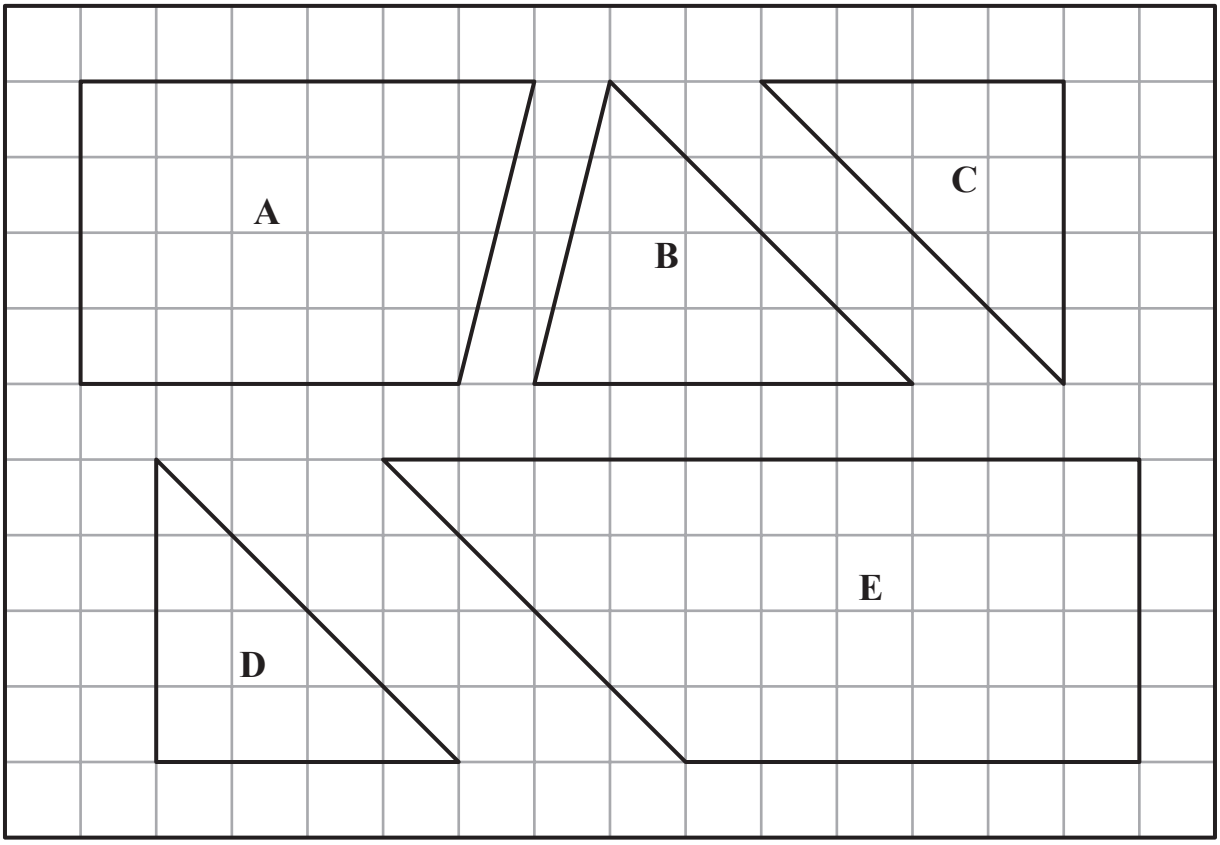
5.60 × 4 = 22.40 ← Multiplying the cost of 5 folders by 4 works out that the cost of 20 folders is £22.40

23.80 + 22.40 = 46.20 ← Adding the costs of 20 pens and 20 folders works out that £46.20 is needed

Yes ← £50 is enough as it is more than £46.20

(Total for Question 8 is 4 marks)

9 The diagram shows five shapes on a centimetre grid.



(a) Write down the name of shape **E**.

Trapezium

(1)

Two of the shapes are congruent. ← Same shape and size

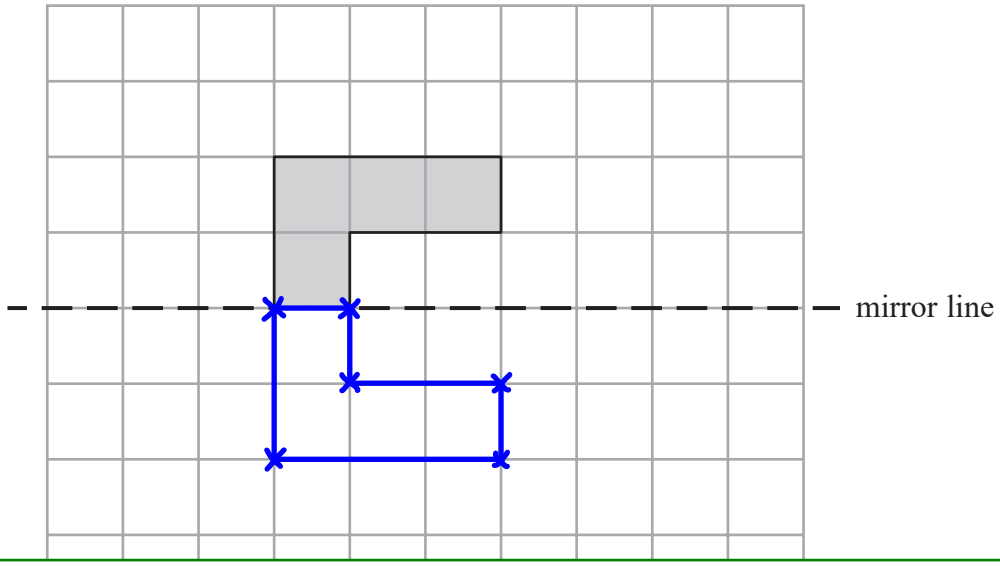
(b) Write down the letters of these two shapes.

C and D

(1)

(Total for Question 9 is 2 marks)

10 On the grid, reflect the shaded shape in the mirror line.



Reflecting the corners first by counting the number of jumps to the line (in the direction perpendicular to the mirror line) then counting the same number of jumps on the other side. Then joining up the corners with a ruler

(Total for Question 10 is 1 mark)

11 There are men and women at a meeting.

There are 28 women.
30% of the people at the meeting are men.

Work out the total number of people at the meeting.

100 - 30 ← Subtracting the 30% from 100% works out that 70% of the people at the meeting are women

28 ÷ 70 ← Dividing the 28 women by 70 works out that 1% of the people at the meeting is 0.4 people

0.4 × 100 ← Multiplying the value of 1% by 100 works out that 100% of the people at the meeting is 40 people

40

(Total for Question 11 is 3 marks)

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DO NOT WRITE IN THIS AREA

12 Joan asked each of 60 people to name their favourite vegetable.

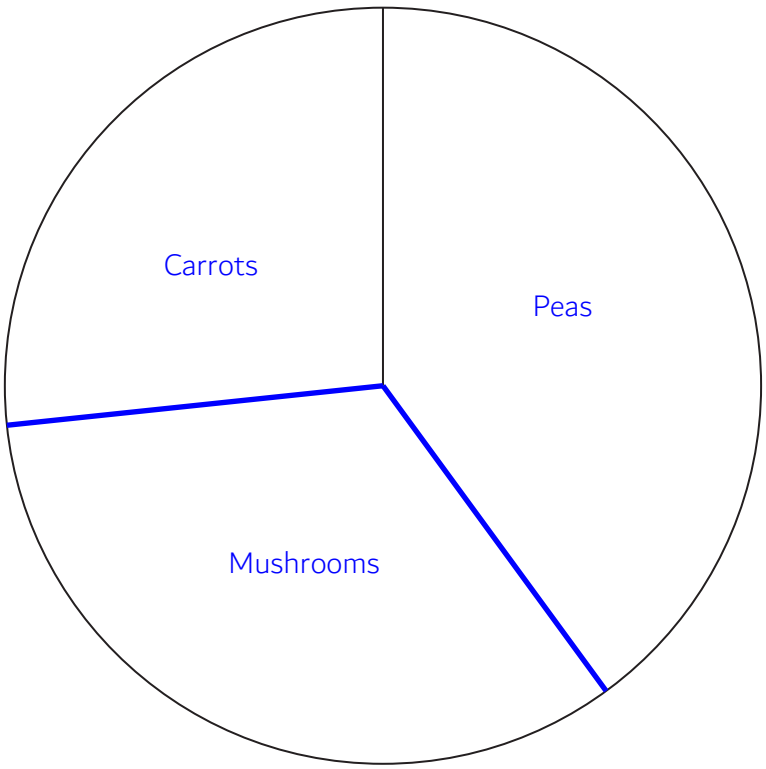
Here are her results.

Vegetable	Frequency
Peas	24
Carrots	16
Mushrooms	20

Draw an accurate pie chart for her results.

360 ÷ 60 = 6 ← There are 360° in total in a pie chart. Dividing the 360° by the 60 people works out that 6° represents 1 person

24 × 6 = 144
16 × 6 = 96
20 × 6 = 120
← Multiplying each frequency by the 6° which represents each person works out the angle needed for each vegetable



Drawing the angles using a protractor. Labelling each sector

(Total for Question 12 is 3 marks)

13 Annie sold

45 books at £1.20 each
34 candles at £1.50 each
some calendars at 90p each

She got a total of £150

Work out how many calendars Annie sold.

45 × 1.20 = 54 ← Multiplying 45 books by the £1.20 each works out that the 45 books gets £54

34 × 1.50 = 51 ← Multiplying 34 candles by the £1.50 each works out that the 34 candles gets £51

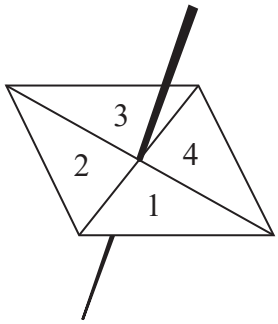
150 - 54 - 51 ← Subtracting the £54 from the books and the £51 from the candles leaves £45 from the calendars

45 ÷ 0.90 ← 90p is £0.90. Dividing the £45 from the calendars by the £0.90 each works out that 50 calendars were sold

50

(Total for Question 13 is 4 marks)

14 Here is a 4-sided spinner.



The table shows the probabilities that when the spinner is spun it will land on 1, on 3 and on 4

Number	1	2	3	4
Probability	0.2		0.4	0.1

The spinner is spun once.

(a) Work out the probability that the spinner will land on 2

$1-0.2-0.4-0.1$ ← It is certain to get one of the numbers so all of the probabilities must add to 1. Subtracting the probabilities for 1, 3 and 4 from 1 leaves the probability for 2

0.3

(1)

(b) Which number is the spinner least likely to land on?

0.1 is the smallest probability

4

(1)

Jake is going to spin the spinner 60 times.

(c) Work out an estimate for the number of times the spinner will land on 1

60×0.2 ← Multiplying the 60 spins by the probability of 1 works out an estimate for how many times it will land on 1

12

(2)

(Total for Question 14 is 4 marks)

15 Bert has 100 cards.
There is a whole number from 1 to 100 on each card.
No cards have the same number.

Bert puts a star on every card that has a multiple of 3 on it.
He puts a circle on every card that has a multiple of 5 on it.

Work out how many cards have both a star and a circle on them.

5, 10, 15 ← Working out that the lowest common multiple of 3 and 5 is 15 by counting in 5s until a multiple of 3 is reached

15, 30, 45, 60, 75, 90 ← Counting in 15s gives all the common multiples of 3 and 5 for the numbers from 1 to 100. There is a star and a circle on each of these cards

Counting the common multiples of 3 and 5 listed finds that there are 6 cards with both a start and a circle on them →

6

(Total for Question 15 is 3 marks)

16 Write down the ratio of 450 grams to 15 grams.
Give your answer in its simplest form.

450 : 15 ← Writing the ratio. They are the same units so no conversions are needed

Ratios simplify in a similar way to fractions. Putting the fraction 450/15 into the calculator simplifies it to 30, which is 30/1. So the ratio will simplify to 30 : 1 →

30 : 1

(Total for Question 16 is 2 marks)

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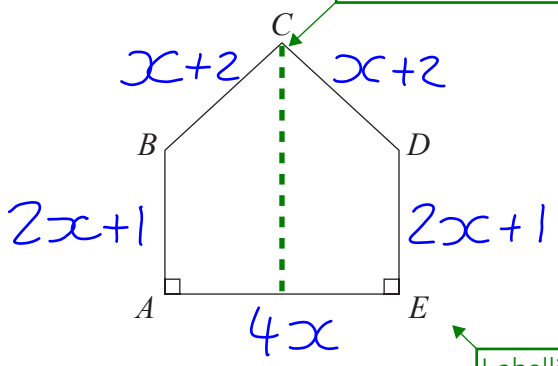
17 The diagram shows a pentagon.
The pentagon has one line of symmetry.

This is the line of symmetry so both sides of it are the same but reflected



Labelling all the sides in terms of x

$AE = 4x$
$AB = 2x + 1$
$BC = x + 2$

All these measurements are given in centimetres.

The perimeter of the pentagon is 18 cm.

(a) Show that $10x + 6 = 18$

$4x + 2x + 1 + x + 2 + x + 2 + 2x + 1$ ← Adding all the outside sides expresses the perimeter

$10x + 6 = 18$ ← Collecting like terms and setting equal to the value of the perimeter

(3)

(b) Find the value of x.

$10x = 12$ ← Subtracting 6 from both sides eliminates the +6 on the left and gets the x term on its own

Dividing both sides by 10 eliminates the 10 on the left and gets x on its own

$x =$ 1.2

(2)

(Total for Question 17 is 5 marks)

18 Trevor buys a boat.
The cost of the boat is £14 200 plus VAT at 20%

Trevor pays a deposit of £5000
He pays the rest of the cost in 10 equal payments.

Work out the amount of each of the 10 payments.

$\frac{20}{100} \times 14200$ ← Putting the 20% over 100 converts it to a fraction. Doing this fraction of the £14200 works out that 20% of £14200 is £2840

$14200 + 2840$ ← Adding the 20% VAT onto the £14200 works out that the cost of the boat is £17040 in total

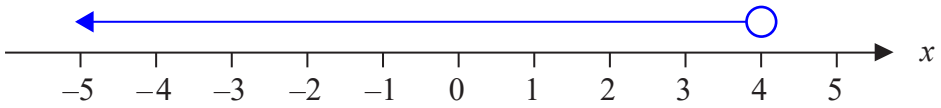
$17040 - 5000$ ← Subtracting the deposit from the total cost of the boat works out that the total of the 10 equal payments is £12040

$12040 \div 10$ ← Dividing the total of the 10 equal payments by 10 works out that each of the 10 payments is £1204

£ 1204

(Total for Question 18 is 4 marks)

19 (a) On the number line, show the inequality $x < 4$



Putting a circle above 4 and an arrow going the left as x is less than 4. Not shading in the circle as x cannot be equal to 4

(2)

$3 < y \leqslant 7$ where y is an integer.

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

Greater than 3 and less than or equal to 7. Integers are not decimals or fractions

4, 5, 6, 7

(2)

(c) Solve $3x + 5 \geqslant x + 17$

$2x + 5 \geq 17$ ← Subtracting x from both sides to get all the x on the same side

$2x \geq 12$ ← Subtracting 5 from both sides to get the x term on its own

Dividing both sides by 2 to get x on its own →

$x \geq 6$

(3)

(Total for Question 19 is 7 marks)

20 (a) Write 7357 correct to 3 significant figures.

Only the first three figures are quoted. All other figures become 0. The 5 rounds to a 6 as there is a 7 in the next place

7360

(1)

(b) Work out $\dfrac{\sqrt{17 + 4^2}}{7.3^2}$

Write down all the figures on your calculator display.

Type into the calculator

0.1077981356

(2)

(Total for Question 20 is 3 marks)

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21 Last year Jo paid £245 for her car insurance.
This year she has to pay £883 for her car insurance.

Work out the percentage increase in the cost of her car insurance.

883 - 245 ← Subtracting the £245 from the £883 works out that the increase is £638

$\frac{638}{245} \times 100$ ← Putting the increase over the original expresses the increase as a fraction. Multiplying by 100 converts this to a percentage

260.4 %

(Total for Question 21 is 3 marks)

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DO NOT WRITE IN THIS AREA

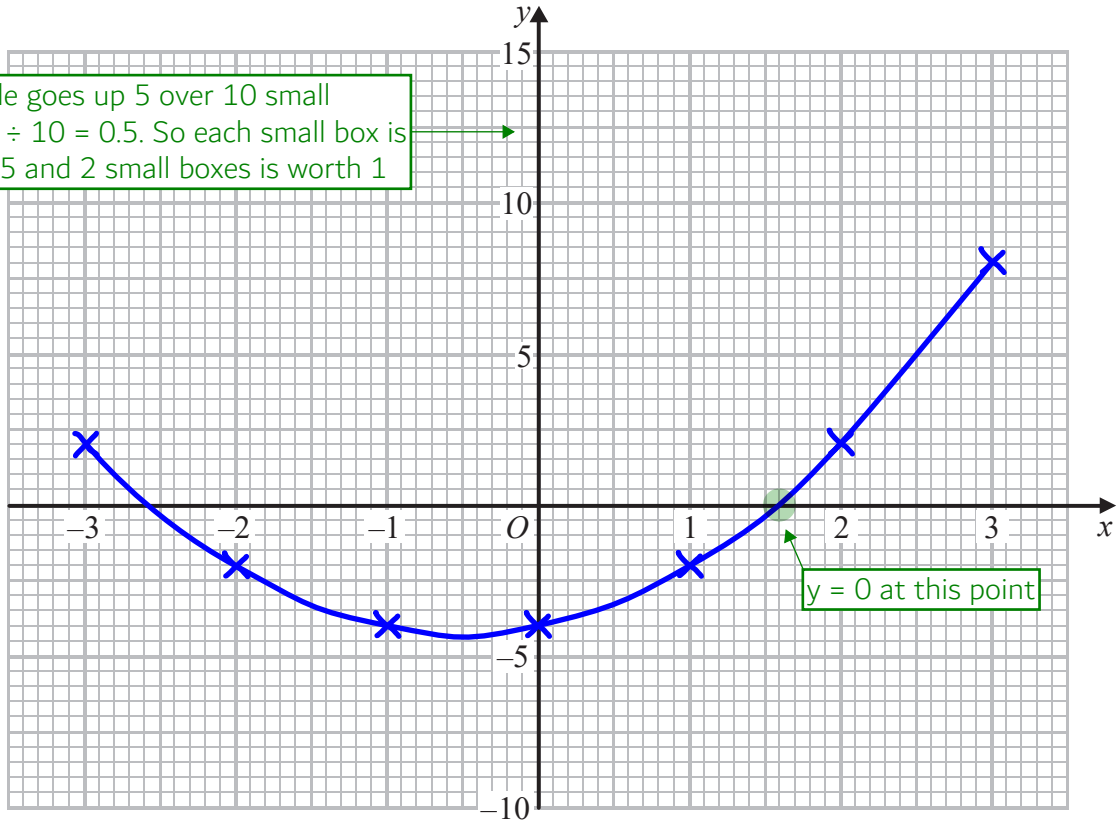
22 (a) Complete this table of values for $y = x^2 + x - 4$

x	–3	–2	–1	0	1	2	3
y	2	–2	–4	-4	–2	2	8

Using table mode on the calculator. Define f(x) = x^2 + x - 4.
Start: -3. End: 3. Step: 1. This completes the table of values

(2)

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from –3 to 3



This scale goes up 5 over 10 small boxes. 5 ÷ 10 = 0.5. So each small box is worth 0.5 and 2 small boxes is worth 1

y = 0 at this point

Plotting the points from the table of values then joining up with a curve

(2)

(c) Use the graph to estimate a solution to $x^2 + x - 4 = 0$

y has been replaced with 0. So it is asking for a value of x when y = 0

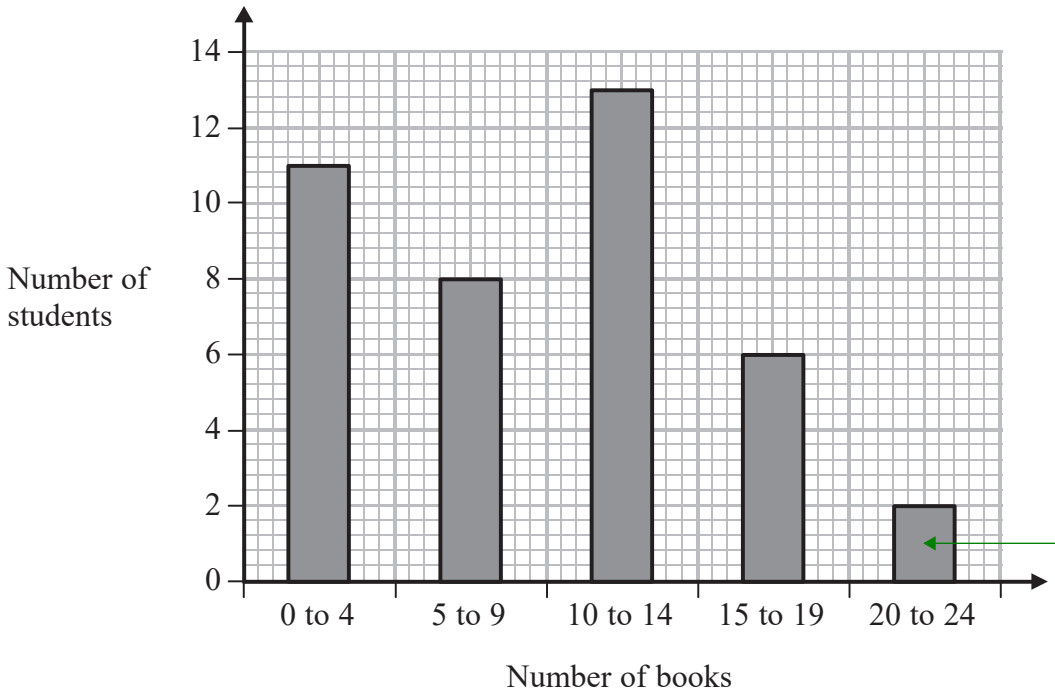
1.6

(1)

(Total for Question 22 is 5 marks)

23 Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.



(a) Work out the percentage of these students who bought 20 or more books.

$\frac{2}{40} \times 100$ ← Expressing the 2 students who bought 20 or more books as a fraction of the 40 students. Multiplying this by 100 converts it to a percentage

5 ..... %

(2)

(b) Show that an estimate for the mean number of books bought is 9.5
You must show all your working.

$2 \times 11 = 22$

$7 \times 8 = 56$

$12 \times 13 = 156$

$17 \times 6 = 102$

$22 \times 2 = 44$

Multiplying the midpoints of the number of books for each category by the number of students for each category works out an estimate of the total number of books bought by all the students in each category

$22 + 56 + 156 + 102 + 44$ ← Adding all the estimated totals gives an estimated overall total of 380 books bought by all the students

$380 \div 40 = 9.5$ ← Dividing the estimated overall total number of books bought by all the students by the 40 students estimates the mean to be 9.5

(4)

(Total for Question 23 is 6 marks)

24 Lara is a skier.

She completed a ski race in 1 minute 54 seconds.
The race was 475 m in length.

Lara assumes that her average speed is the same for each race.

(a) Using this assumption, work out how long Lara should take to complete a 700 m race.
Give your answer in minutes and seconds.

700 ÷ 475 ← Dividing the 700 m by the 475 m works out that the 700 m is 1.4... times the distance of the 475 m

0°1°54° × 1.4... ← Multiplying the 1 minute 54 seconds by the 1.4... times the distance works out the time it should take for the 700 m as the average speed is the same. Entering 0 hours 1 minute 54 seconds as a sexagesimal on the calculator and using the exact answer for 1.4...

0°2'48" can be read as 2 minutes 48 seconds

2 minutes 48 seconds

(3)

Lara's average speed actually increases the further she goes.

(b) How does this affect your answer to part (a)?

It would take less time

700m is further than 475m so the average speed would be higher

(1)

(Total for Question 24 is 4 marks)

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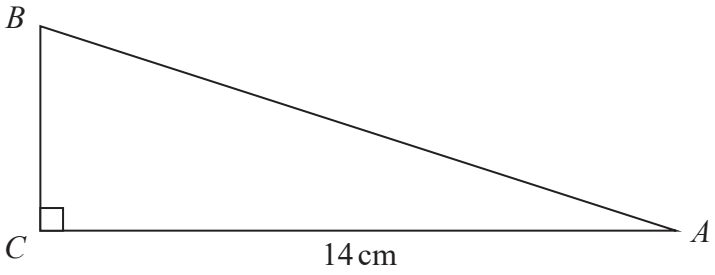
25 ABC is a right-angled triangle.



$AC = 14$ cm.
Angle $C = 90°$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB.
Give your answer correct to 3 significant figures.

180 - 90 ← There are 180° in a triangle. Subtracting angle C from 180° works out that the total of angle A and angle B is 90°

90 ÷ 5 ← 3 + 2 = 5 parts in total in the ratio which represent the 90° total of angle A and angle B. So dividing the 90° by 5 works out that 1 part of the ratio is worth 18°

18 × 3 = 54 ← Multiplying the value of 1 part of the ratio by the 3 parts which represent angle B works out that angle B is 54°

S Ó H C A H T Ó A ← Using right-angled trigonometry. Ticking O as the 14 cm is the opposite to angle B. Ticking H as AB is the hypotenuse. There are two ticks on the SOH formula triangle so this one can be used

14 ÷ sin54 ← Covering H in the SOH formula triangle finds that hypotenuse = opposite ÷ sin of the angle

17.30... is rounded to 3 significant figures

17.3 cm

(Total for Question 25 is 4 marks)

26 Here are the first four terms of an arithmetic sequence.

5 11 17 23

Write down an expression, in terms of n, for the nth term of the sequence.

The sequence goes up 6 each term so it must involve 6n. Going backward in the sequence finds that the 0th term (the term before the 1st term) would be -1. So the nth term must be 6n - 1

6n-1

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS