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 ▶

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Hints

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

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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 + [　　　] = 100 ← 100 - 56.3

(1)

(ii) $\frac{2}{7}$ + [　　　] = 1 ← 1 - 2/7

(1)

(Total for Question 1 is 2 marks)

2 Write 3% as a fraction.

Percent means out of 100

....

(Total for Question 2 is 1 mark)

3 Find $\sqrt{1.44}$

Type into the calculator

....

(Total for Question 3 is 1 mark)

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

1/8 x 720

....

(Total for Question 4 is 1 mark)

1/8 x 720

.CG Maths.

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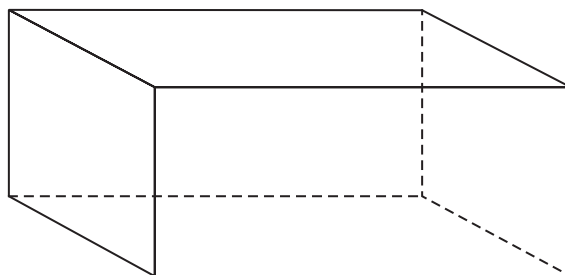
(a) Write down the name of this 3-D shape.

.... Cub...
(1)

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

Count them on the diagram

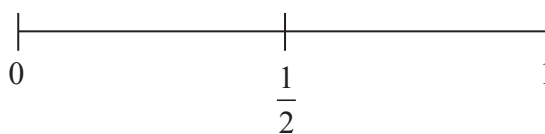..
(1)

(Total for Question 5 is 2 marks)

6 An ordinary fair dice is thrown once.

(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

0        $\frac{1}{2}$ 1

(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

....
(1)

(Total for Question 6 is 2 marks)

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7 Shaun is 1.88 m tall.

David is 6 cm taller than Shaun.

How tall is David?

There are 100cm in 1m so 1.88m is 188cm as 1.88 x 100 = 188

....

(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.

2 x 10 = 20 so 10 lots of 2 pens need to be bought. 5 x 4 = 20 so 4 lots of 5 folders need to be bought. Work out the total cost of 20 pens and 20 folders then compare this to the £50 he has

(Total for Question 8 is 4 marks)

.CG Maths.

9 The diagram shows five shapes on a centimetre grid.
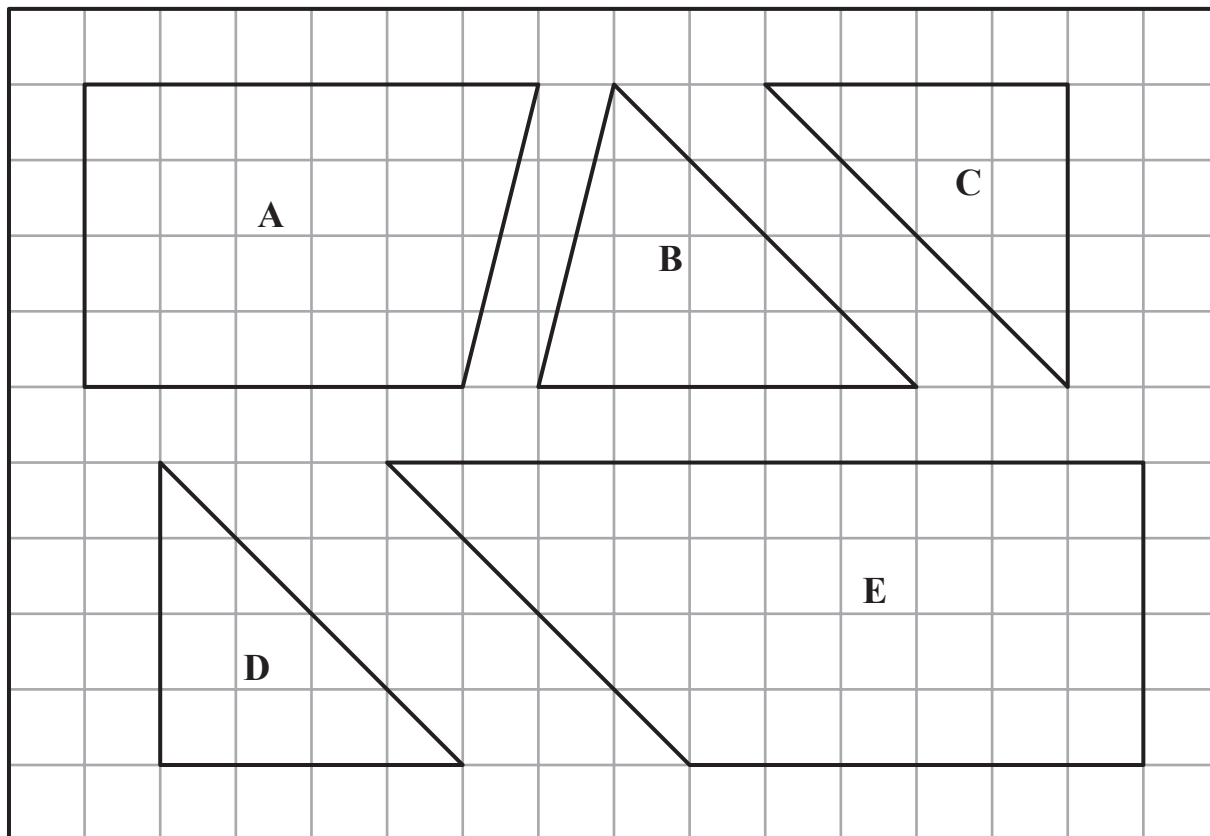
(a) Write down the name of shape **E**.

.... Trap…

(1)

Two of the shapes are congruent.

The sides and angles are the same. It can be rotated and/or reflected

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

.... and ....

(1)

(Total for Question 9 is 2 marks)

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

---- mirror line

Reflect 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 join up the corners with a ruler
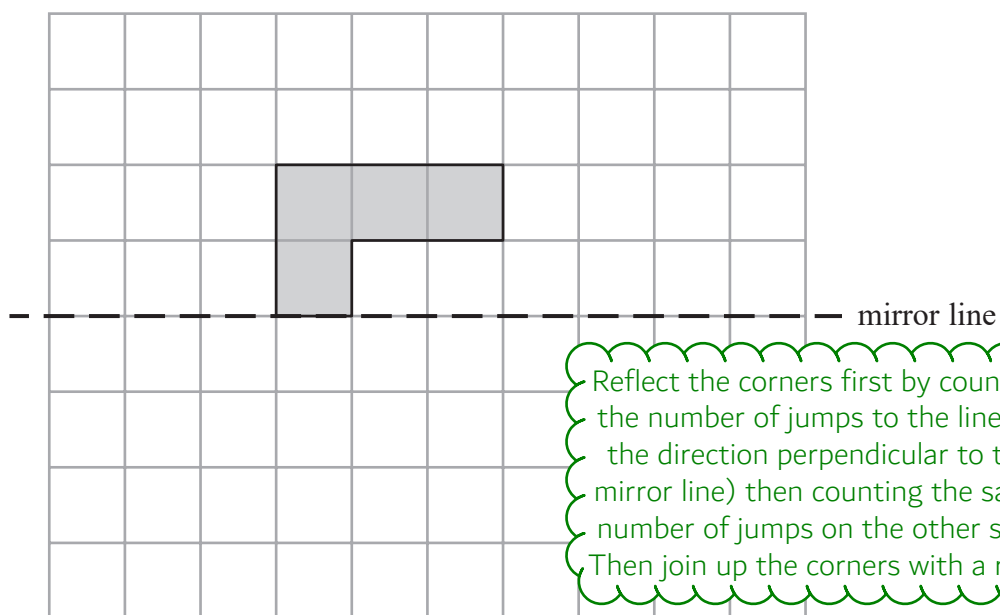
(Total for Question 10 is 1 mark)

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.

30% are men so 70% must be women as 100 - 30 = 70. 70% is 0.7 as a decimal. Total x 0.7 = 28

....

(Total for Question 11 is 3 marks)

.CG Maths.

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

Here are her results.

$360 \div 60 = 6$

This works out how many degrees represents 1 person

Vegetable	Frequency
Peas	24
Carrots	16
Mushrooms	20

Draw an accurate pie chart for her results.

Use a protractor to measure and draw the angles onto the chart
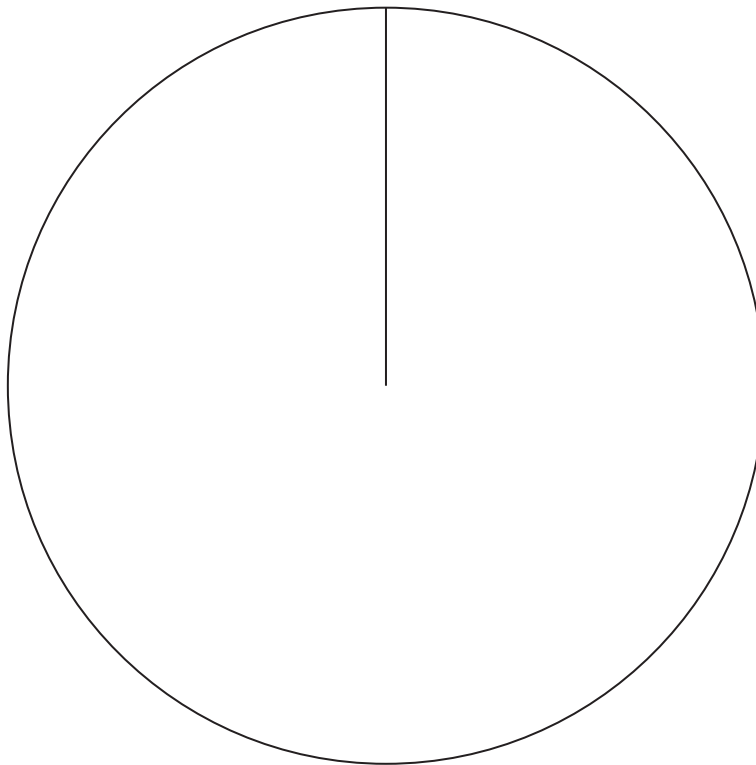
(Total for Question 12 is 3 marks)

.CG Maths.

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.

Subtract the costs of 45 books and 34 candles from £150 to work out how much money was spent on the calendars. Divide the result by £0.90 to work out how many lots of £0.90 go in and therefore how many calendars were sold
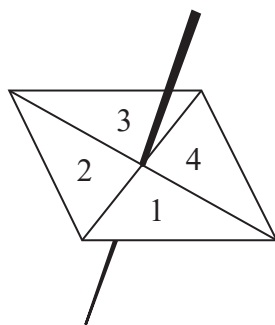
....

(Total for Question 13 is 4 marks)

.CG Maths.

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

It is certain to get either a 1, 2, 3 or 4 so all of the probabilities add to 1

....

(1)

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

What is the smallest probability?

....

(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

The probability is a good estimate for the relative frequency. Multiply the number of times it is spun by the estimate of the relative frequency

....

(2)

(Total for Question 14 is 4 marks)

.CG Maths.

Turn over ▶

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.

First find the lowest common multiple of 3 and 5. Then list all the multiples of the lowest common multiple which are less than 100. Count the numbers listed

....

(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 = 30

Fractions simplify in a similar way to ratios. 30 as a fraction is 30/1

....

(Total for Question 16 is 2 marks)

.CG Maths.

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

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

$x+2$

$2x+1$

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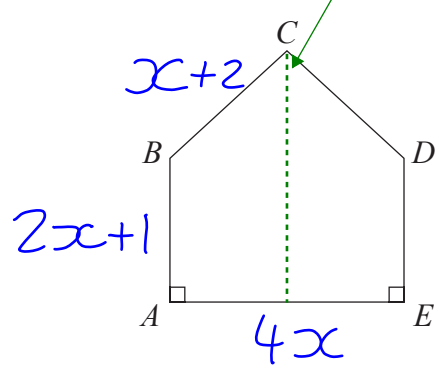
$AE = 4x$
$AB = 2x + 1$
$BC = x + 2$

All these measurements are given in centimetres.

The perimeter of the pentagon is 18 cm.

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

The perimeter is all of the sides added together

(3)

(b) Find the value of x.

Rearrange the equation 10x + 6 = 18 to make x the subject. x is on the left side and everything else on that side needs to go. Follow BIDMAS backwards to decide what to get rid of first

$x = $ ....

(2)

(Total for Question 17 is 5 marks)

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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.

100% + 20% = 120%, which as a decimal is 1.2. Multiplying by 1.2 adds the VAT of 20%. Subtracting the deposit leaves the total of the 10 equal payments. Then work out the amount of one of the 10 payments
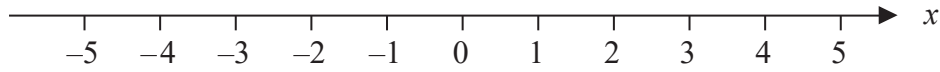
£ ....

(Total for Question 18 is 4 marks)

.CG Maths.

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

$$\xrightarrow{\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad} x$$

$$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$$

Put a circle above 4. Colour in the circle if x can be equal to 4. Put an arrow from the circle pointing in the direction of the numbers represented

(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 whole numbers

....

(2)

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

The inequality rearranges in a similar way to an equation except that dividing or multiplying by negative numbers means we have to flip the inequality sign. Get all the x terms on one side then follow BIDMAS backward to eliminate everything apart from x

....

(3)

(Total for Question 19 is 7 marks)

.CG Maths.

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

Only the first three figures are quoted. All other figures become 0. The third figure needs to be rounded up or down depending on what the fourth figure is

....

(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

....

(2)

(Total for Question 20 is 3 marks)

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.

Use the percentage change formula: (new - old)/old x 100

....%

(Total for Question 21 is 3 marks)

.CG Maths.

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

x	−3	−2	−1	0	1	2	3
y		−2	−4		−2		

(2)

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

10 boxes = 5 so each box is worth 0.5
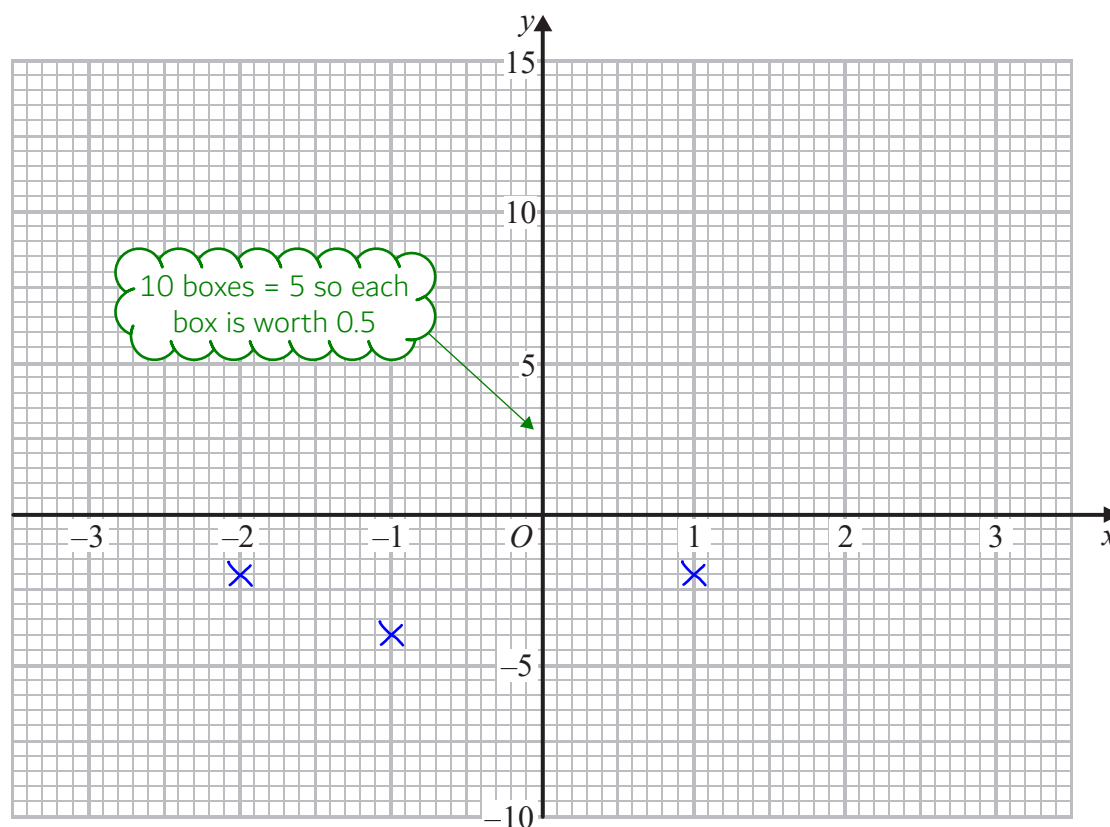
(2)

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

Estimate what x is when y is 0
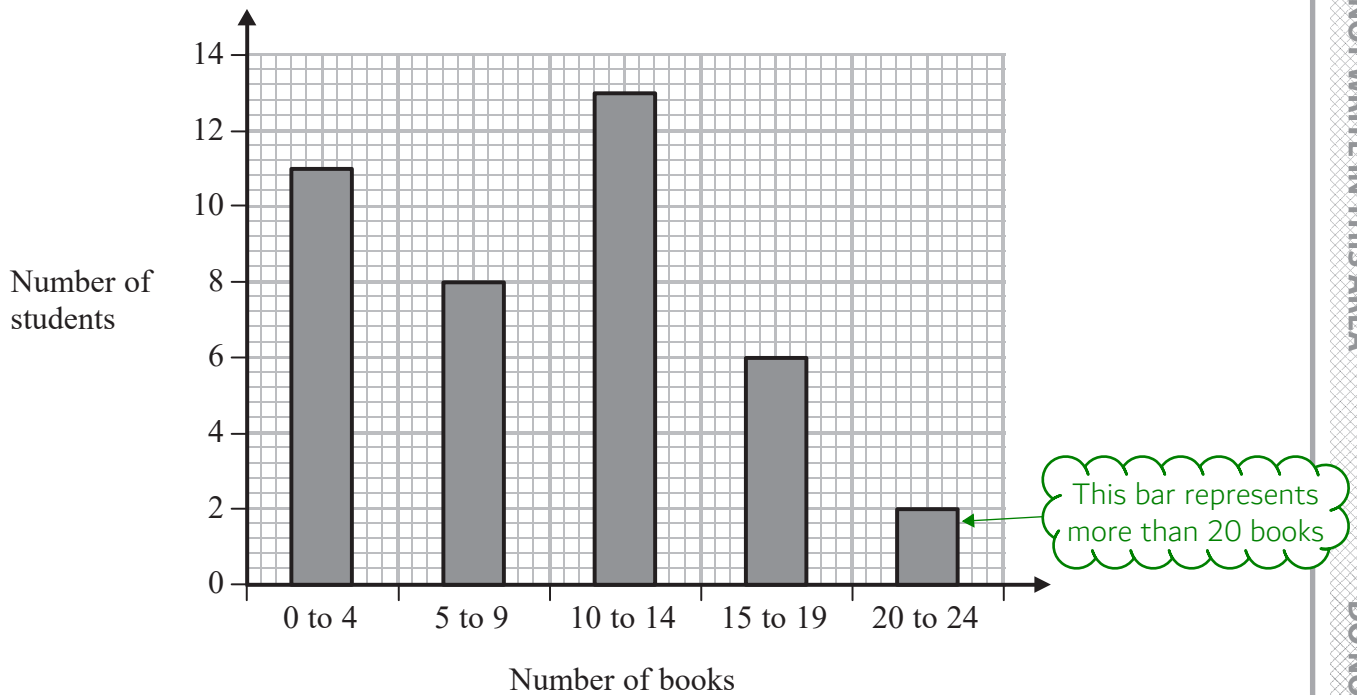
....

(1)

(Total for Question 22 is 5 marks)

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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.

This bar represents more than 20 books

Number of books

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

Express the number of students who bought more than 20 books as a fraction of the total number of students. Then multiply by 100 to convert it into a percentage

....%

(2)

.CG Maths.

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

Mean = total/number. To estimate the total, multiply the number of students for each category by the mid point of the number of books for that category then add together all the results. The number is 40 as there are 40 students

(4)

(Total for Question 23 is 6 marks)

.CG Maths.

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.

$\dfrac{d}{s \mid t}$

> 1. Work out the average speed for the 475m race in metres per second. Convert the minutes and seconds into seconds to do this.
>
> 2. Work out the time taken for the 700m race in seconds by using the same average speed as the 475m race.
>
> 3. Convert the seconds into minutes and seconds

.... minutes .... seconds

(3)

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

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

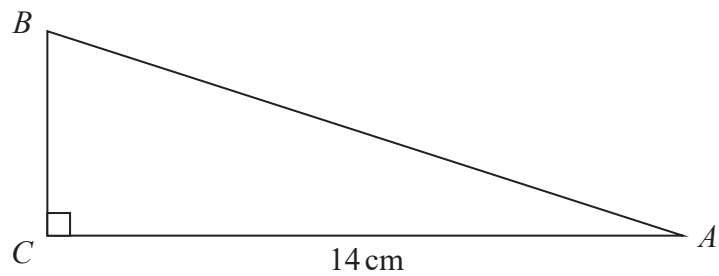> 700m is further than 475m so the average speed would be higher

(1)

(Total for Question 24 is 4 marks)

.CG Maths.

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.

> 1. Work out the total of angles A and B then divide the result into the ratio 3:2 to work out one of the angles.
>
> 2. Use SOH CAH TOA to work out the hypotenuse AB.
>
> 3. Round the result to 3 significant figures

....cm

(Total for Question 25 is 4 marks)

.CG Maths.

19

Turn over ▶

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

$$5 \qquad 11 \qquad 17 \qquad 23$$

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

> The sequence goes up 6 each term so it must involve 6n. We now need to adjust the nth term by adding or subtracting a constant

....

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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