

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

Pearson Edexcel

Level 1/Level 2 GCSE (9–1)

Thursday 6 June 2019

Morning (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. 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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.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 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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 0.75 as a fraction.

This is a common conversion so is one we should know. Otherwise, dividing 75 by 100 gives 0.75 so it could be written as $\frac{75}{100}$

$$\frac{3}{4}$$

(Total for Question 1 is 1 mark)

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

-3 4 0 -1 2

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

-3 -1 0 2 4

(Total for Question 2 is 1 mark)

3 Write down two factors of 15

$1 \times 15 = 15$
 $3 \times 5 = 15$
So 1, 15, 3 and 5 are factors of 15

1, 15

(Total for Question 3 is 1 mark)

4 Change 1756 grams to kilograms.

There are 1000 grams in a kilogram so dividing 1756 by 1000 converts it into kilograms. To divide by 1000, move the decimal place three times to the left

1.756 kg

(Total for Question 4 is 1 mark)

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5 Write the number two million in figures.

1 million has six zeros after the 1

2000000

(Total for Question 5 is 1 mark)

6 Dave goes into a cafe and buys 2 cups of coffee and a piece of cake.

Each cup of coffee costs £2.75

The cake costs £2.90

Dave pays with a £10 note.

He thinks he will get more than £1.50 in change.

Is Dave correct?

You must show how you get your answer.

10 - 2 x 2.75 - 2.90 = £1.60

Subtracting the amount spent from the £10 works out the change

The total cost of 2 cups of coffee

The cost of the cake

The change is £1.60, which is more than £1.50

Yes

(Total for Question 6 is 3 marks)

- 7 There are y boats on a lake.
There are 7 people in each boat.

Write an expression, in terms of y , for the total number of people in the boats.

There are y lots of 7 people in total in the boats so we multiply y by 7 to get $7y$

$7y$

(Total for Question 7 is 1 mark)

- 8 (a) Simplify $a \times b \times 7$

They can be multiplied in any order. Writing them next to each other means to multiply. The number should be written before the letters

$7ab$

(1)

- (b) Simplify $y \times y \times y$

Anything multiplied by itself twice can be written to the power of 3

y^3

(1)

- (c) Simplify fully $\frac{e \times e \times e \times f}{e \times e \times f \times f}$

Fractions can be simplified by dividing both the numerator and denominator by a common factor. In this case, this cancels out any letter which appears on both the numerator and denominator

$\frac{e}{f}$

(2)

(Total for Question 8 is 4 marks)

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
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9 The pictogram shows information about the number of vinyl records sold in a shop on Monday and on Tuesday.

Monday	
Tuesday	
Wednesday	
Thursday	

Key:



represents
8 vinyl records

(a) Write down the number of vinyl records sold

(i) on Monday,

There are 3 full circles and each one represents 8 vinyl records. $3 \times 8 = 24$

24

(1)

(ii) on Tuesday.

There are $2\frac{1}{4}$ circles and each one represents 8 vinyl records. $\frac{1}{4}$ of 8 is 2. $8 + 8 + 2 = 18$

18

(1)

On Wednesday and Thursday a total of 36 vinyl records were sold.

The number of records sold on Thursday was 8 times the number of records sold on Wednesday.

(b) Use this information to complete the pictogram.

$x + 8x = 36$

Let x be the number of vinyl records sold on Wednesday. Thursday would be $8x$ as there were 8 times the amount sold. Adding together Wednesday and Thursday gives a total of 36

$9x = 36$

$x = 4$

4 were sold on Wednesday and 32 were sold on Thursday

$8x = 32$

$4 \div 8 = \frac{1}{2}$

Working out how many lots of 8 each is works out how many circles represents each day

$32 \div 8 = 4$

(3)

(Total for Question 9 is 5 marks)

10 Here are three symbols.

The value on the left is more than the value on the right

The value on the left is less than the value on the right

The value on the left is equal to the value on the right

< > =

Write one of these symbols in each box to make four true statements.

$$14 \quad < \quad 21$$

$$11 = 4 + 7 \quad = \quad 103 - 92 = 11$$

$$4 = 2^2 \quad = \quad 2 \times 2 = 4$$

$$-3 \quad > \quad -5$$

(Total for Question 10 is 2 marks)

11 $P = 7r + 3q$

Work out the value of P when $r = 5$ and $q = -4$

$7(5) + 3(-4)$ ← Substitute r for 5 and q for -4

23

(Total for Question 11 is 2 marks)

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12 Here is part of a train timetable.

Brighton	07 22	07 29	07 32
London	09 00	08 32	08 48

Graham gets to the station in Brighton at 07 15


(a) Work out how many minutes he has to wait until 07 22

$22 - 15 = 7$

As the hours are the same in both times, we can subtract the minutes to work out the difference in time

..... 7 minutes
(1)

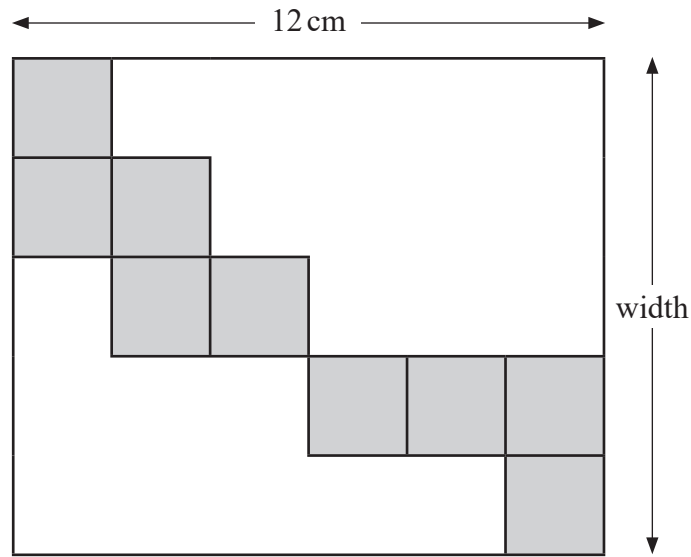
(b) Work out how long it will take the 07 22 train to get to London.

FACT B $9^{\circ}00' - 7^{\circ}22' = 1^{\circ}38'0''$
 Press the button on the left to get the ° symbol

..... 1 hour 38 minutes
(2)

(Total for Question 12 is 3 marks)

13 The diagram shows nine identical squares inside a rectangle.



The length of the rectangle is 12 cm.

Work out the width of the rectangle.

$$12 \div 6 = 2$$

The rectangle is 6 squares long. Therefore dividing the length of the rectangle by 6 works out the length of each square

$$2 \times 5$$

The rectangle is 5 squares wide. Therefore multiplying the length of a square by 5 works out the width of the rectangle

.....10.....cm

(Total for Question 13 is 3 marks)

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14 Write the ratio 4.5 : 2.25 in the form $n : 1$

$4.5/2.25 = 2$

To convert a ratio into an equivalent ratio, divide or multiply both sides by the same amount. 2.25 is divided by 2.25 to get 1 so 4.5 also needs to be divided by 2.25

2:1

(Total for Question 14 is 1 mark)

15 A garden is in the shape of a rectangle 90 m by 60 m.

90 m

Flowers are grown in 40% of the garden.
The rest of the garden is grass.



60 m

Work out the area of the garden that is grass.

$0.6 \times 90 \times 60$

Area of rectangle = length x width

$100\% - 40\% = 60\%$
 $60/100 = 0.6$
The whole garden is 100% so subtracting the 40% which is flowers leaves the percentage which is grass. Dividing this by 100 converts it into a decimal multiplier

3240 m²

(Total for Question 15 is 4 marks)

16 Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.33
B	0.033
C	$\frac{1}{3} = 0.\dot{3}$
D	30% = 0.3

(a) (i) Which coin is least likely to land on Heads?

0.033 is the smallest probability

B

(1)

(ii) Which coin is most likely to land on Heads?

$\frac{1}{3}$ is the greatest probability

C

(1)

Julie says,

“The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails.”

(b) Is she correct?

Give a reason for your answer.

No as the probability for heads is $\frac{1}{3}$ and tails is $\frac{2}{3}$

$$1 - \frac{1}{3} = \frac{2}{3}$$

It is certain that the coin will either be heads or tails so both probabilities will add up to 1. Therefore subtracting the probability of getting heads from 1 leaves the probability of getting tails

(1)

Coin B is going to be thrown 4000 times.

(c) Work out an estimate for the number of times coin B will land on Heads.

$$0.033 \times 4000$$

The probability is an estimate of the relative frequency and multiplying this by the number of times it is thrown gives the estimate of the times it will land on heads

132

(2)

(Total for Question 16 is 5 marks)

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17 There are 84 calories in 100 g of banana.
There are 87 calories in 100 g of yogurt.

Priti has 60 g of banana and 150 g of yogurt for breakfast.

Work out the total number of calories in this breakfast.

$$\frac{60}{100} \times 84 + \frac{150}{100} \times 87$$

60/100 is the 60g as a fraction of the 100g for the banana.
Multiplying this by the calories in 100g works out the calories in 60g.

150/100 is the 150g as a fraction of the 100g for the yogurt.
Multiplying this by the calories in 100g works out the calories in 150g.

Adding together the number of calories in the banana and yogurt gives the total amount of calories in the breakfast

.....180.9

(Total for Question 17 is 4 marks)

18 Machine A and machine B both make car parts.

Machine A makes 6 parts every 10 minutes.

Machine B makes 13 parts every 15 minutes.

On Monday

machine A makes parts for 12 hours

machine B makes parts for 10 hours

Work out the total number of parts made by the two machines on Monday.

$$\frac{12 \times 60}{10} \times 6 + \frac{10 \times 60}{15} \times 13$$

12 x 60 converts the hours into minutes. Dividing by 10 works out how many lots of 10 minutes machine A works for. Each lot of 10 minutes is 6 parts made so multiplying by 6 works out how many parts machine A makes.

10 x 60 converts the hours into minutes. Dividing by 15 works out how many lots of 15 minutes machine B works for. Each lot of 15 minutes is 13 parts made so multiplying by 13 works out how many parts machine B makes.

Adding together the parts made by machines A and B works out the total number of parts made

952

(Total for Question 18 is 4 marks)

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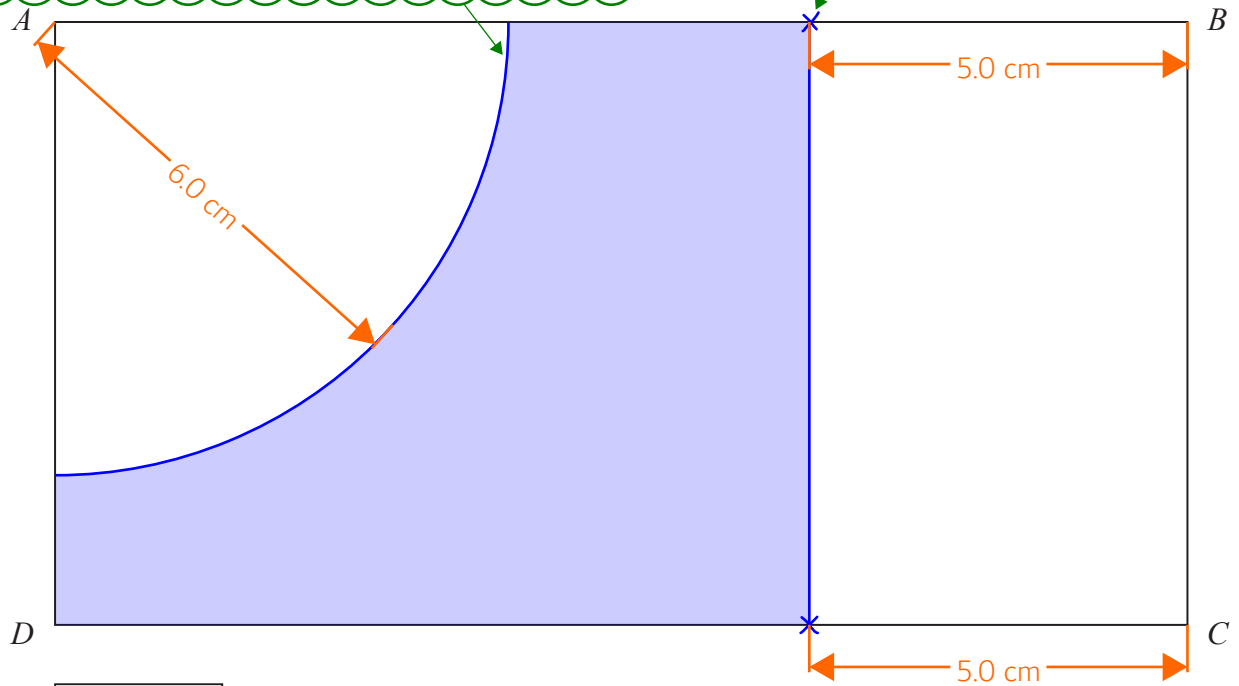
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19 Here is a plan of a kitchen drawn to a scale of 1 : 30

Use a compass to scribe an arc with radius 6cm to show all points which are exactly 6cm away from A

Use a ruler to mark 5cm to the left from points B and C then join up the two crosses with a straight line



Scale 1:30

Sam is going to put a small table in the kitchen.

The table has to be

more than 180 cm from A $180 \div 30 = 6$
 more than 150 cm from BC $150 \div 30 = 5$

The scale means that every 30 units of length in the real world is 1 unit in the diagram. So dividing by 30 works out how many lots of 30 each is and therefore converts the lengths into what is needed on the diagram

Show, by shading on the diagram, the region where Sam can put the table.

(Total for Question 19 is 4 marks)

20 (a) Solve $14n > 11n + 6$

$$3n > 6$$

Subtract $11n$ from both sides to get all the n terms on the same side of the equation.

Divide both sides by 3 to get n on its own.

$$n > 2$$

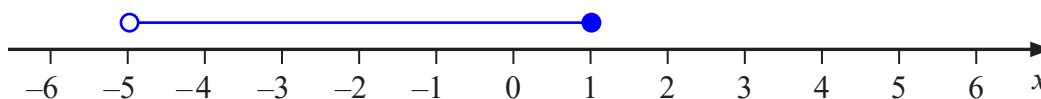
(2)

(b) On the number line below, show the set of values of x for which $-2 < x + 3 \leq 4$

$$-5 < x \leq 1$$

Closed circle means that the value is included in the set. Open circle means the value isn't included. A line is drawn over the values included between the circles.

Subtract 3 from all sides of the inequality to get x on its own.



(3)

(Total for Question 20 is 5 marks)

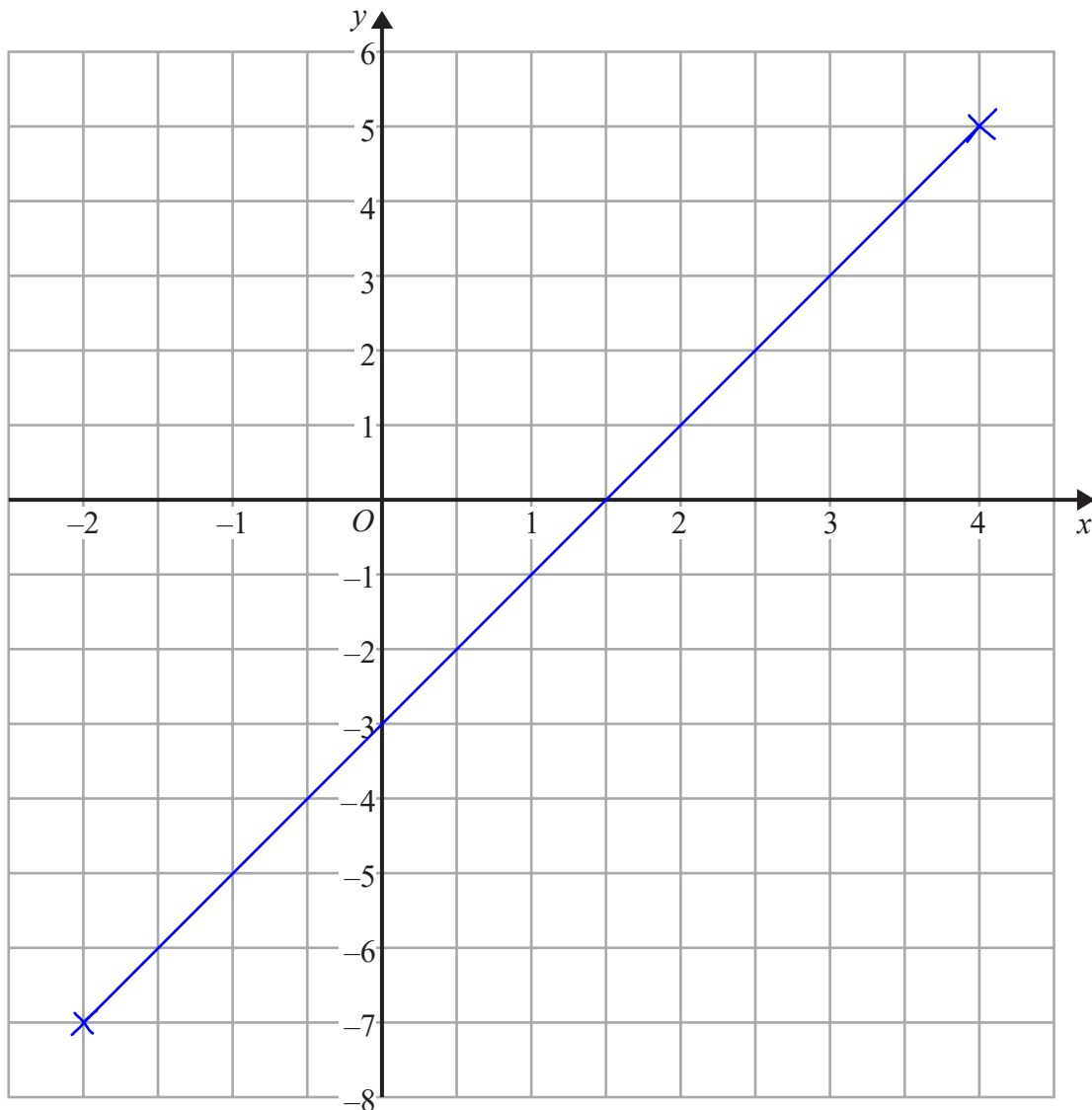
21 On the grid below, draw the graph of $y = 2x - 3$ for values of x from -2 to 4

$$y = 2 \times (-2) - 3 = -7$$

$$y = 2 \times 4 - 3 = 5$$

Substituting in the highest and lowest values of x (any two values will do but this technique can possibly get a more accurate line).

It is a linear equation (no powers of x or y) so the line will be straight. Therefore only two points are required to draw the line.



(Total for Question 21 is 3 marks)

22 Hannah is planning a day trip for 195 students.

She asks a sample of 30 students where they want to go.
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	10
Theatre	5
Sports Centre	8
Seaside	7

(i) Work out how many of the 195 students you think will want to go to the Theme Park.

$$\frac{10}{30} \times 195$$

10 out of the 30 in the sample chose the Theme Park therefore we can estimate that there will be this fraction of the total students.

65
(2)

(ii) State any assumption you made **and** explain how this may affect your answer.

The sample was representative of the whole group. The answer would be different if this wasn't true.

(1)

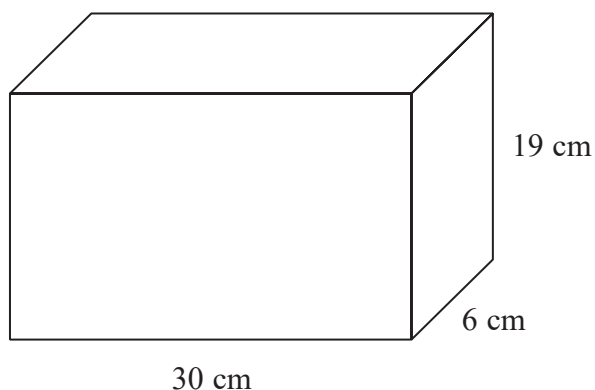
(Total for Question 22 is 3 marks)

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23 A container is in the shape of a cuboid.



The container is $\frac{2}{3}$ full of water.

A cup holds 275 ml of water.

What is the greatest number of cups that can be completely filled with water from the container?

Multiplying by $\frac{2}{3}$ works out the volume of the water.

This works out the volume of the container in cubic centimetres.

$$\frac{2}{3} \times 30 \times 6 \times 19 = 8.290$$

275

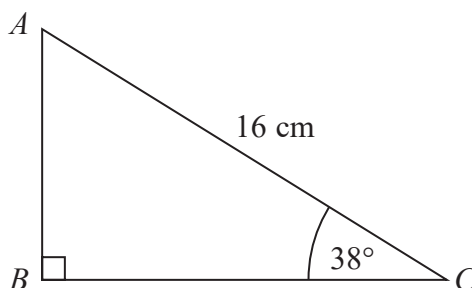
Dividing by 275 works out how many lots of 275ml go into the volume of the water. 1ml is 1cm^3 .

We are looking for full cups so the answer is rounded down.

..... 8

(Total for Question 23 is 4 marks)

24 ABC is a right-angled triangle.



Calculate the length of AB .
Give your answer correct to 2 decimal places.

$$\begin{array}{c} \text{O} \quad \text{A} \quad \text{O} \\ \text{S} \quad \text{H} \quad \text{C} \quad \text{H} \quad \text{T} \quad \text{A} \\ \sin 38^\circ \times 16 \end{array}$$

There is a right angled triangle with a problem involving sides and angles so SOH CAH TOA can be used. We have the hypotenuse and are finding the opposite so the sin formula can be used. From the formula triangle: opposite = sin of the angle x hypotenuse

$$\dots\dots\dots 9.85 \dots\dots\dots \text{cm}$$

(Total for Question 24 is 2 marks)

25 Sally used her calculator to work out the value of a number y .

The answer on her calculator display began

8.3

Complete the error interval for y .

$$\dots\dots\dots 8.3 \dots\dots \leq y < \dots\dots 8.4 \dots\dots\dots$$

(Total for Question 25 is 2 marks)

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26 £360 is shared between Abby, Ben, Chloe and Denesh.

The ratio of the amount Abby gets to the amount Ben gets is 2:7

Chloe and Denesh each get 1.5 times the amount Abby gets.

Work out the amount of money that Ben gets.

$$2 \times 1.5 = 3$$

$$2 : 7 : 3 : 3$$

If Abby gets 2 parts, Chloe and Denesh both get 1.5 times this so they both get 3 parts.

$$\frac{360}{2+7+3+3} \times 7$$

Dividing by the total number of parts calculates the value of 1 part. Multiplying by 7 calculates the value of 7 parts, which Ben has.

£..... 168

(Total for Question 26 is 4 marks)

27 (a) Write 0.00562 in standard form.

Multiply by 10 3 times to get a decimal between 1 and 10 so multiplying by 10^{-3} keeps the value the same.

$$\underline{5.62 \times 10^{-3}}$$

(1)

(b) Write 1.452×10^3 as an ordinary number.

Multiply by 10 3 times.

$$\underline{1452}$$

(1)

(Total for Question 27 is 2 marks)

28 Here are the first five terms of a Fibonacci sequence.

3 3 6 9 15

(a) Write down the next two terms of the sequence.

$$\begin{array}{l} 9 + 15 = 24 \\ 15 + 24 = 39 \end{array}$$

To get the next term, add together the previous two terms

$$\dots\dots\dots 24, \dots\dots\dots 39 \dots\dots\dots (1)$$

The first three terms of a different Fibonacci sequence are

a a $2a$ $3a$ $5a$

(b) Find the 6th term of this sequence.

To get the next term, add together the previous two terms.
 $a + 2a = 3a$
 $2a + 3a = 5a$
 $3a + 5a = 8a$

$$\dots\dots\dots 8a \dots\dots\dots (2)$$

(Total for Question 28 is 3 marks)

29 $\mathbf{a} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

Work out $\mathbf{a} - 2\mathbf{b}$ as a column vector.

$$\begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$\begin{array}{l} 4 - 6 = -2 \\ 5 - 4 = 1 \end{array}$$

This is $2\mathbf{b}$

$$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$$

(Total for Question 29 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS