

Write your name here

Surname

Other names

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

Centre Number

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Candidate Number

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# Mathematics

## Paper 2 (Calculator)

**Foundation Tier**

Thursday 7 June 2018 – Morning  
**Time: 1 hour 30 minutes**

Paper Reference

**1MA1/2F**

**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  $\pi$  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.
- 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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6/7/7/7/8/7/1/c2/1/

**.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](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  $\frac{4}{50}$  as a percentage.

To convert a fraction into a percentage, multiply it by 100

..... 8 %

(Total for Question 1 is 1 mark)

- 2 Write 1.59 correct to 1 decimal place.

The 5 is in the 1st decimal place. The 9 in the next place causes it to round up to a 6 and all other figures after it are ignored

..... 1.6

(Total for Question 2 is 1 mark)

- 3 Work out the value of  $3^5$

Type into the calculator

..... 243

(Total for Question 3 is 1 mark)

- 4 Write down a 6 digit number that has 4 as its thousands digit. You can only use the digit 4 once.

It is easier to start writing the digits from the right. The 4 needs to be in the 4th place from the right

..... 104000

(Total for Question 4 is 1 mark)

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5 (a) Change 35 cm to mm.

There are 10mm in 1cm, so multiply by 10

350 mm  
(1)

(b) Change 7700 millilitres to litres.

There are 1000ml in 1L, so divide by 1000

7.7 litres  
(1)

(c) Change 0.32 kilograms to grams.

There are 1000g in 1kg, so multiply by 1000

320 grams  
(1)

(Total for Question 5 is 3 marks)

6 Margaret is thinking of a number. She says,

“My number is odd. It is a factor of 36 and a multiple of 3”

There are two possible numbers Margaret can be thinking of.

Write down these two numbers.

1, 36  
2, 18  
3, 12  
4, 9  
6

Listing out the factors of 36, starting with the smallest and writing them in pairs. 36, 18, 3 and 9 are multiples of 3 but only 3 and 9 are odd as well

3 9

(Total for Question 6 is 3 marks)

- 7 Mohsin, Yusuf and Luke are going to play a game.  
At the end of the game, one of them will be in First place, one of them will be in Second place and one of them will be in Third place.

Use the table below to list all the possible outcomes of the game.

First place	Second place	Third place
M	Y	L
M	L	Y
Y	M	L
Y	L	M
L	M	Y
L	Y	M

(Total for Question 7 is 2 marks)

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8 Neil buys 30 pens, 30 pencils, 30 rulers and 30 pencil cases.

Price list	
pens	6 for 82p
pencils	15 for 45p
rulers	10 for £1.25
pencil cases	37p each

What is the total amount of money Neil spends?

$$5 \times 0.82 + 2 \times 0.45 + 3 \times 1.25 + 30 \times 0.37$$

$30 \div 6 = 5$  so 5 lots of 6 pens are bought

$30 \div 15 = 2$  so 2 lots of 15 pencils are bought

$30 \div 10 = 3$  so 3 lots of 10 rulers are bought

30 pencil cases are bought

£.....19.85.....

(Total for Question 8 is 5 marks)

9 Emily drives 186 miles in 3 hours.

(a) What is her average speed?

$$\frac{d}{s \quad t}$$

From the formula triangle,  
speed = distance/time

$$s = \frac{186}{3}$$

..... 62 ..... mph  
(2)

Sarah drives at an average speed of 58 mph for 4 hours.

(b) How many miles does Sarah drive?

$$\frac{d}{s \quad t}$$

From the formula triangle,  
distance = speed x time

$$d = 58 \times 4$$

..... 232 ..... miles  
(2)

(Total for Question 9 is 4 marks)

10 (a) Write down all the prime numbers between 20 and 30

Numbers with only two factors  
(whole numbers they can be  
divided by), themselves and 1

..... 23, 29 .....  
(2)

Catherine says,

“2 is the only even prime number.”

(b) Is Catherine right?

You must give a reason for your answer.

Yes, all other even numbers have 2 as a factor

(1)

(Total for Question 10 is 3 marks)

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11 (a) Solve  $x + x + x = 51$

$$3x = 51$$
$$x = \frac{51}{3}$$

$$x = \frac{17}{(1)}$$

(b) Solve  $\frac{y}{4} = 3$

Multiply both sides by 4 to eliminate the 4 from the left side and make y the subject

$$y = \frac{12}{(1)}$$

(c) Solve  $2f + 7 = 18$

$$2f = 11$$

Follow BIDMAS backward to rearrange the equation and make f the subject. First subtract 7 from both sides to eliminate the 7 from the left. Then divide both sides by 2 to eliminate the 2 from the left

$$f = \frac{11}{2} (1)$$

(Total for Question 11 is 3 marks)



Divide the total number of degrees in the chart by the total number of fans to work out how many degrees represent 1 fan

12 A group of football fans were asked what their half time snack was.

The table below gives information about their answers.

$$360 \div 36 = 10$$

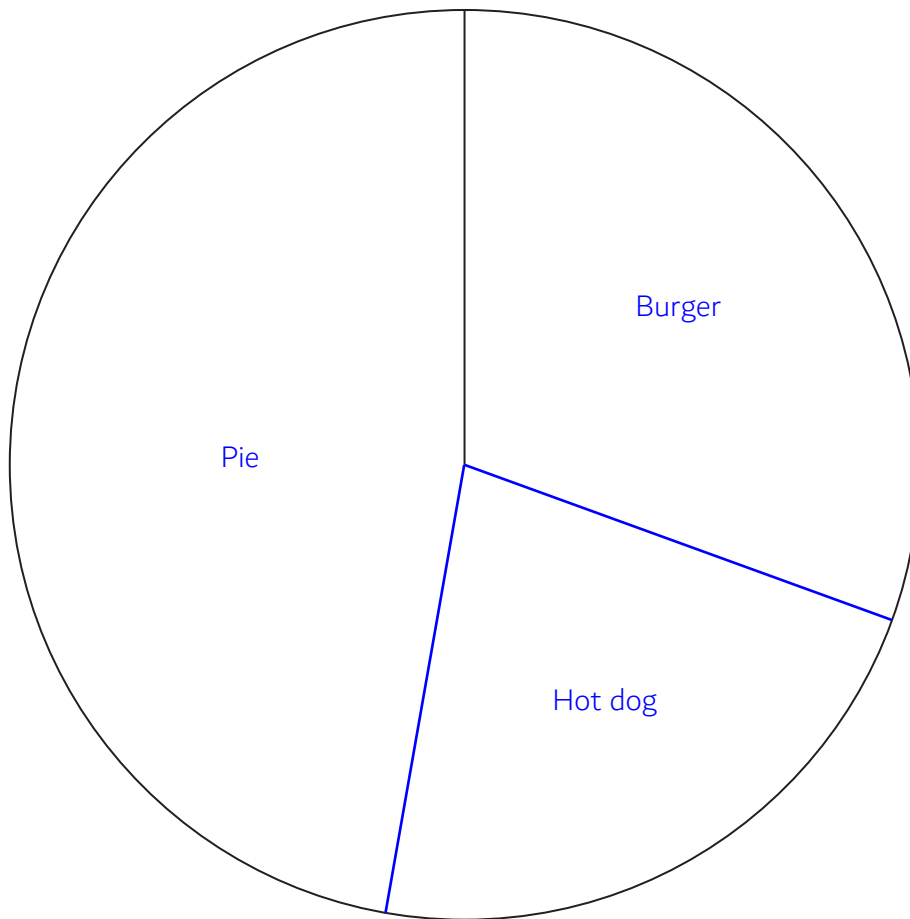
Snack	Number of fans
burger	11
pie	17
hot dog	8

Angle  
110  
170  
80

Draw an accurate pie chart for this information.

Use a protractor to measure and draw the angles

10 degrees represents 1 fan so multiply the number of fans by 10 to work out the angle for each category



(Total for Question 12 is 3 marks)

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13 A scout group has a raffle to raise money for charity.  
There is 1 prize to be won in the raffle.

Laura buys 12 raffle tickets.  
A total of 350 raffle tickets are sold.

Find the probability that Laura does **not** win the prize.

$$350 - 12 = 338$$

This works out how many tickets Laura doesn't have.  
Picking one of these means she does not win the prize

338 out of the 350 tickets would  
result in Laura not winning

$$\frac{338}{350}$$

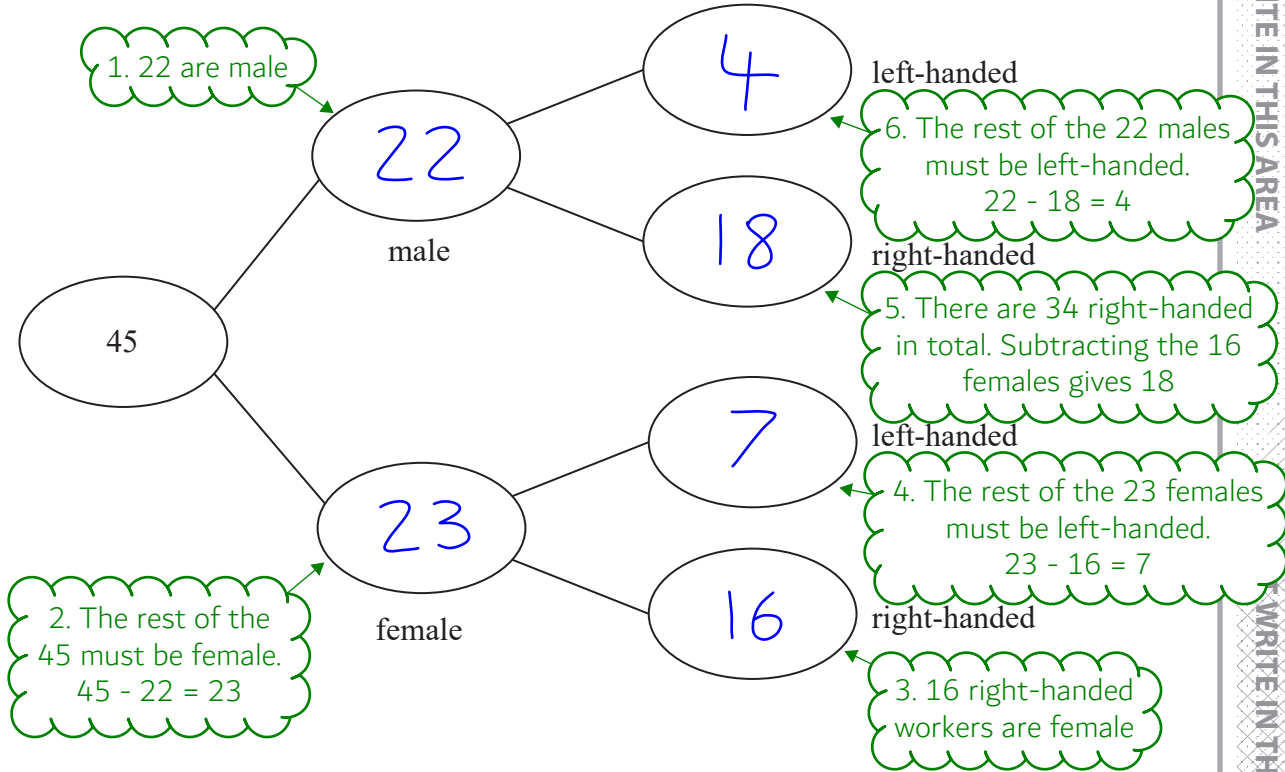
(Total for Question 13 is 2 marks)

14 Each worker in a factory is either left-handed or right-handed.

22 of the 45 workers are male.

16 of the 34 right-handed workers are female.

Complete the frequency tree for this information.



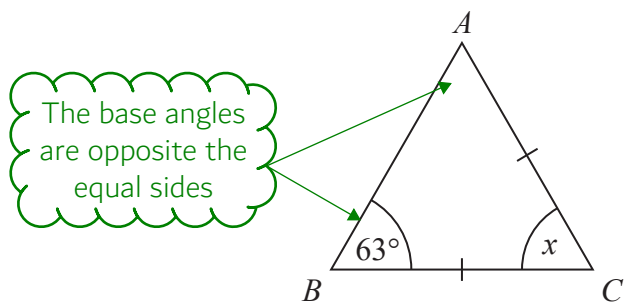
(Total for Question 14 is 3 marks)

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15 Mary needs to work out the size of angle  $x$  in this diagram.



She writes

$x = 63^\circ$  because base angles of an isosceles triangle are equal.

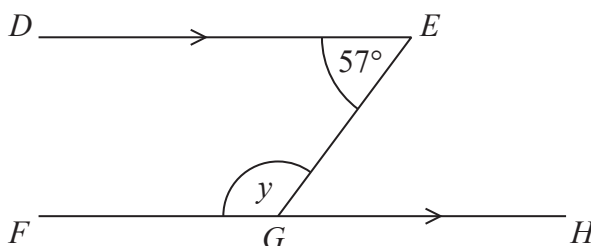
Mary is wrong.

(a) Explain why.

$x$  is not a base angle

(1)

William needs to work out the size of angle  $y$  in this diagram.



William writes

Working	Reason
angle $EGH = 57^\circ$	because corresponding angles are equal
$y = 180^\circ - 57^\circ$ $y = 123^\circ$	because angles on a straight line add up to $180^\circ$

This reason is wrong

One of William's reasons is wrong.

(b) Write down the correct reason.

Alternate angles are equal

(1)

(Total for Question 15 is 2 marks)

16 Marla buys some bags of buttons.

There are 19 buttons or 20 buttons or 21 buttons or 22 buttons in each bag.

The table gives some information about the number of buttons in each bag.

Number of buttons	Frequency
19	5
20	7
21	3
22	1

The total number of buttons is 320

Complete the table.

$$7 \times 20 + 3 \times 21 + 1 \times 22 = 225$$

Working out how many buttons there are excluding the bags of 19

$$320 - 225 = 95$$

Working out how many buttons there are in total in the bags of 19

$$95 \div 19$$

Working out how many bags of 19 go into the total of 95 buttons

(Total for Question 16 is 3 marks)

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17 Here is the list of ingredients for making 30 biscuits.

Ingredients for 30 biscuits
225 g butter
110 g caster sugar
275 g plain flour
75 g chocolate chips

Lucas has the following ingredients.

- 900 g butter
- 1000 g caster sugar
- 1000 g plain flour
- 225 g chocolate chips

What is the greatest number of biscuits Lucas can make?  
You must show your working.

$$900 \div 225 = 4$$

Working out how many batches of butter he has

$$1000 \div 110 = 9.09$$

Working out how many batches of sugar he has

$$1000 \div 275 = 3.63$$

Working out how many batches of flour he has

$$225 \div 75 = 3$$

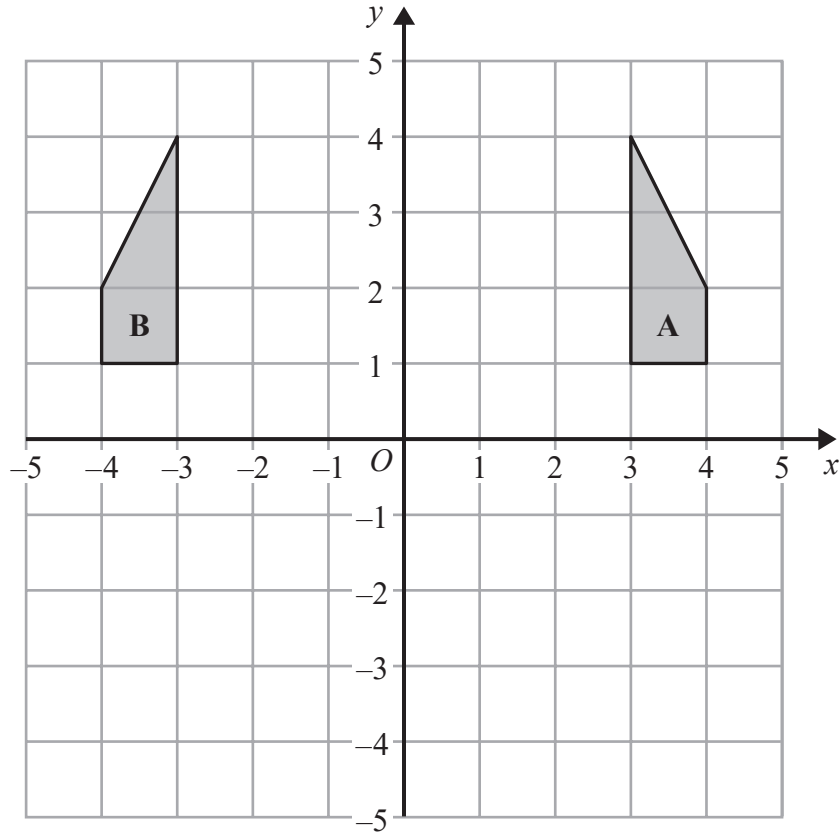
Working out how many batches of chips he has

$$30 \times 3$$

The chocolate chips is the limiting factor. If he uses all of them, he has enough of the other ingredients. There are enough chips for 3 batches of 30

90

(Total for Question 17 is 3 marks)



Describe fully the single transformation that maps shape A onto shape B.

Reflection in the y axis

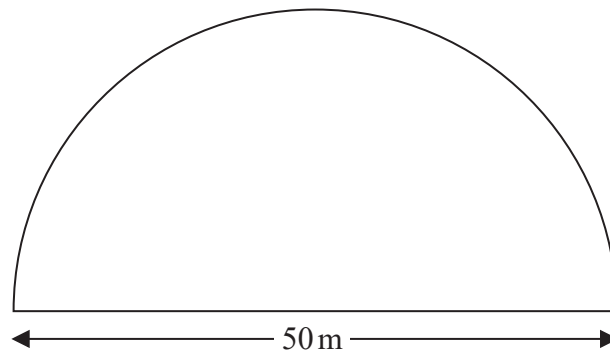
(Total for Question 18 is 2 marks)

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19 A farmer has a field in the shape of a semicircle of diameter 50 m.



The farmer asks Jim to build a fence around the edge of the field.  
Jim tells him how much it will cost.

Total cost = £29.86 per metre of fence plus £180 for each day's work

Jim takes three days to build the fence.

Work out the total cost.

$$29.86 \left( \frac{1}{2} \pi \times 50 + 50 \right) + 180 \times 3 = 4378.198916$$

$\pi \times \text{diameter} = \text{circumference}$ , so multiplying this by  $1/2$  works out the length of the curved edge of the semicircle. Adding the 50m straight edge works out the total length of the fence. Multiplying this by the £29.86 per metre works out the cost for the fence

This works out the cost of the £180 for 3 days of work. Adding this to the cost of the fence gives the total cost

The total cost is rounded to the nearest penny

£ 4378.20

(Total for Question 19 is 5 marks)



20 (a) Simplify  $m^3 \times m^4$

$$a^x \times a^y = a^{x+y}$$

$$m^7$$

(1)

(b) Simplify  $(5np^3)^3$

$$(a^x)^y = a^{xy}$$

Everything in the bracket is raised to the power of 3

$$125n^3p^9$$

(2)

(c) Simplify  $\frac{32q^9r^4}{4q^3r}$

r is basically  $r^1$

$$a^x \div a^y = a^{x-y}$$

$$8q^6r^3$$

(2)

(Total for Question 20 is 5 marks)

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21 (a) Find the lowest common multiple (LCM) of 40 and 56

40, 80, 120, 160, 200, 240, 280  
56, 112, 168, 224, 280

Use table mode (press Menu then 3) with  $f(x) = 40x$  and  $g(x) = 56x$ . Start: 1. End: 30. Step: 1. This lists out the multiples of both numbers

280  
-----  
(2)

$A = 2^3 \times 3 \times 5$

$B = 2^2 \times 3 \times 5^2$

(b) Write down the highest common factor (HCF) of A and B.

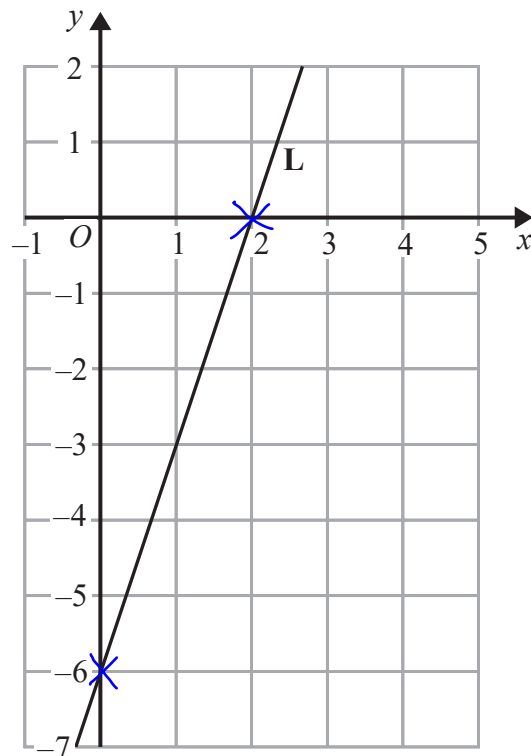
$2^2 \times 3 \times 5$

Multiply all the prime factors which are common to both A and B

60  
-----  
(1)

(Total for Question 21 is 3 marks)

22 The line **L** is shown on the grid.



Find an equation for **L**.

$$m = \frac{6}{2} = 3$$

Gradient = change in  $y$  / change in  $x$   
Change in  $y$  from  $-6$  to  $0$  is  $6$ .  
Change in  $x$  from  $0$  to  $2$  is  $2$

$y = mx + c$  is the general equation of a straight line, where  $m$  is the gradient and  $c$  is the  $y$ -intercept

$$y = 3x - 6$$

(Total for Question 22 is 3 marks)

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23 Raya buys a van for £8500 plus VAT at 20%

Raya pays a deposit for the van.

She then pays the rest of the cost in 12 equal payments of £531.25 each month.

Find the ratio of the deposit Raya pays to the total of the 12 equal payments.

Give your answer in its simplest form.

$$8500 \times 1.2 = 10200$$

Increasing the £8500 by 20% to work out the total cost

$$531.25 \times 12 = 6375$$

Working out the total of the 12 equal payments

$$10200 - 6375 = 3825$$

Working out the deposit

$$3825 : 6375$$

The ratio of the deposit to the total of the 12 equal payments

Ratios simplify in a similar way to fractions. Putting  $3825/6375$  into the calculator simplifies to  $3/5$

3:5

(Total for Question 23 is 5 marks)

24 (a) Complete the table of values for  $y = x^2 - x - 6$

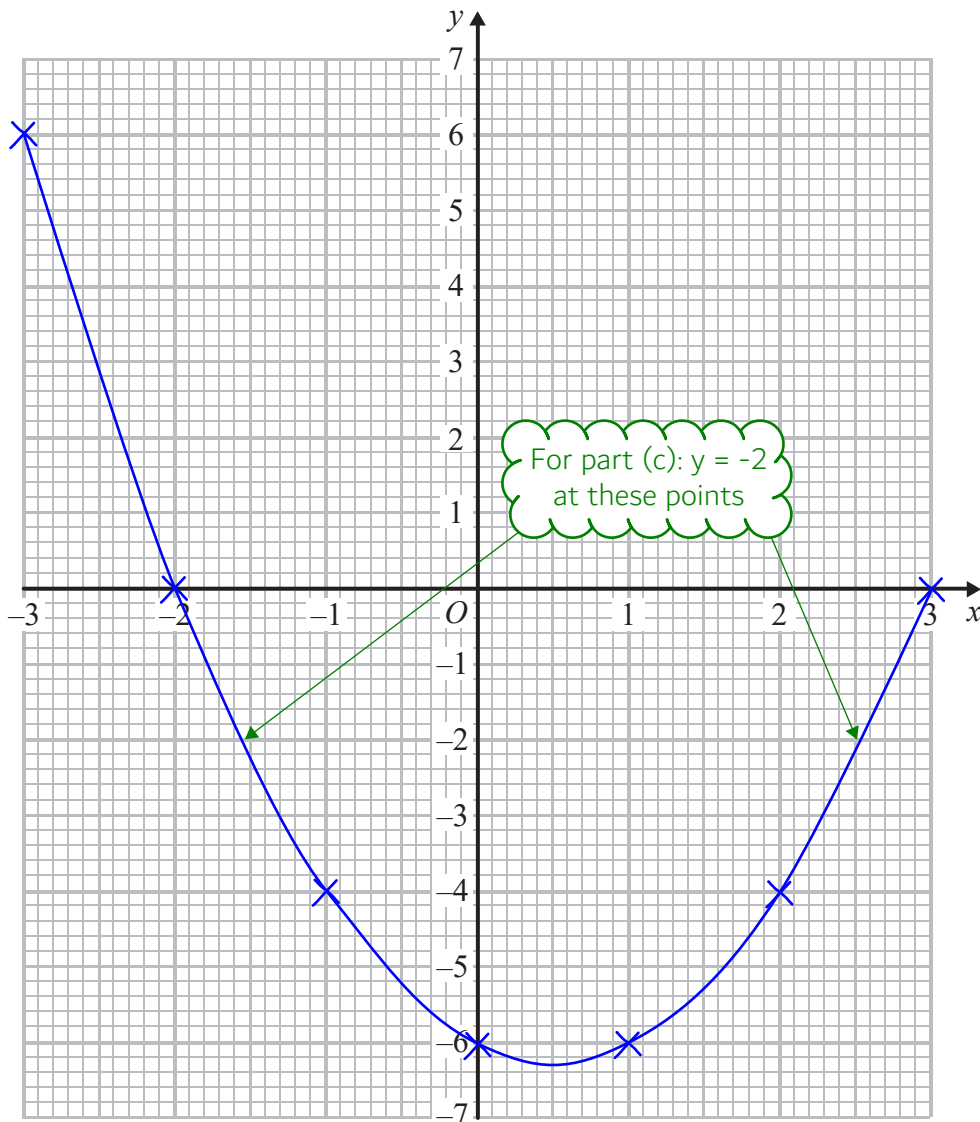
$x$	-3	-2	-1	0	1	2	3
$y$	6	0	-4	-6	-6	-4	0

Using table mode (press Menu then 3) with the  $f(x) = x^2 - x - 6$ . Start: -3. End: 3. Step: 1

(2)

(b) On the grid, draw the graph of  $y = x^2 - x - 6$  for values of  $x$  from -3 to 3

(2)



(c) Use your graph to find estimates of the solutions to the equation  $x^2 - x - 6 = -2$

2.55, -1.55

(2)

(Total for Question 24 is 6 marks)

25 A force of 70 newtons acts on an area of  $20 \text{ cm}^2$

The force is increased by 10 newtons.

The area is increased by  $10 \text{ cm}^2$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Helen says,

“The pressure decreases by less than 20%”

Is Helen correct?

You must show how you get your answer.

$$\frac{70}{20} \times 0.8 = 2.8$$

Decreasing the original pressure by 20%

$$\frac{80}{30} = 2.6$$

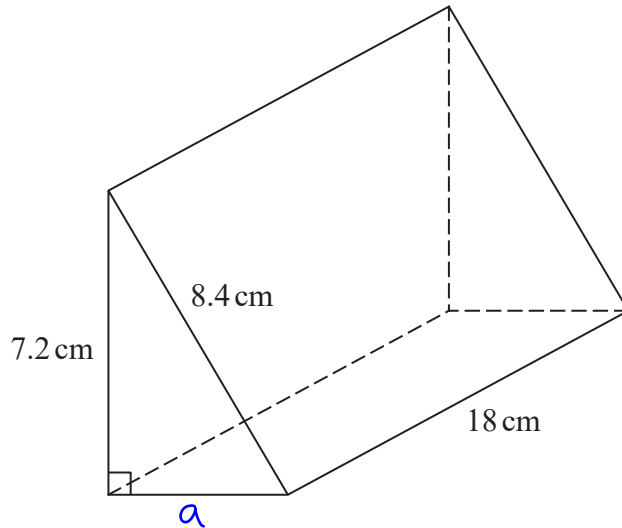
Working out the new pressure

No

The new pressure is less than the original when decreased by 20% so the decrease must be more than 20%

(Total for Question 25 is 3 marks)

26 Here is a triangular prism.



Work out the volume of the prism.

Give your answer correct to 3 significant figures.

$$a^2 + b^2 = c^2$$

To work out side a, we need to use Pythagoras' Theorem

$$a = \sqrt{8.4^2 - 7.2^2}$$

Rearranged to make a the subject and substituted in the values of b and c

$$\frac{1}{2} \times a \times 7.2 \times 18$$

Volume of prism = area of cross section  $\times$  length  
Area of triangle =  $\frac{1}{2} \times$  base  $\times$  height

280.3676672 rounds to  
280 to 3 significant figures

..... 280 ..... cm<sup>3</sup>

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS