AQA

.CG Maths.
Hints

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
MATHEMATICS

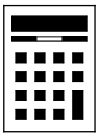
F

Foundation Tier Paper 2 Calculator

Monday 6 November 2017 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.



Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice
- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	

Please note that these worked solutions have neither been provided nor approved by AQA 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 in the spaces provided

1 How many minutes are there in $2\frac{1}{4}$ hours?

Circle your answer.

[1 mark]

135 145 215 225

There are 60 minutes in an hour

2 Which of these numbers is **half** of a square number?

Circle your answer.

[1 mark]

1 2 3 4

Multiply each of the numbers by 2, as this is the opposite of halving, to see if it gives a square number. A square number is the result of squaring (multiplying it by itself) a positive whole number

3 Circle the value of the digit 3 in the number 17.03

[1 mark]

$\frac{3}{10}$ $\frac{1}{30}$ $\frac{3}{100}$ $\frac{1}{300}$

The 3 is in the hundredths place

4 The value of A is double the value of B.

Circle the correct formula.

[1 mark]

$A = B + 2$ $A = 2B$ $A = \frac{B}{2}$ $A = B^2$

A = 2 x B

5 (a) Simplify $y \times y$

[1 mark]

Answer _____

y is multiplied by itself so it is squared

5 (b) Simplify $5a + 2 - a + 9$

[2 marks]

_____

Collect the like terms

_____

Answer _____

Turn over for the next question

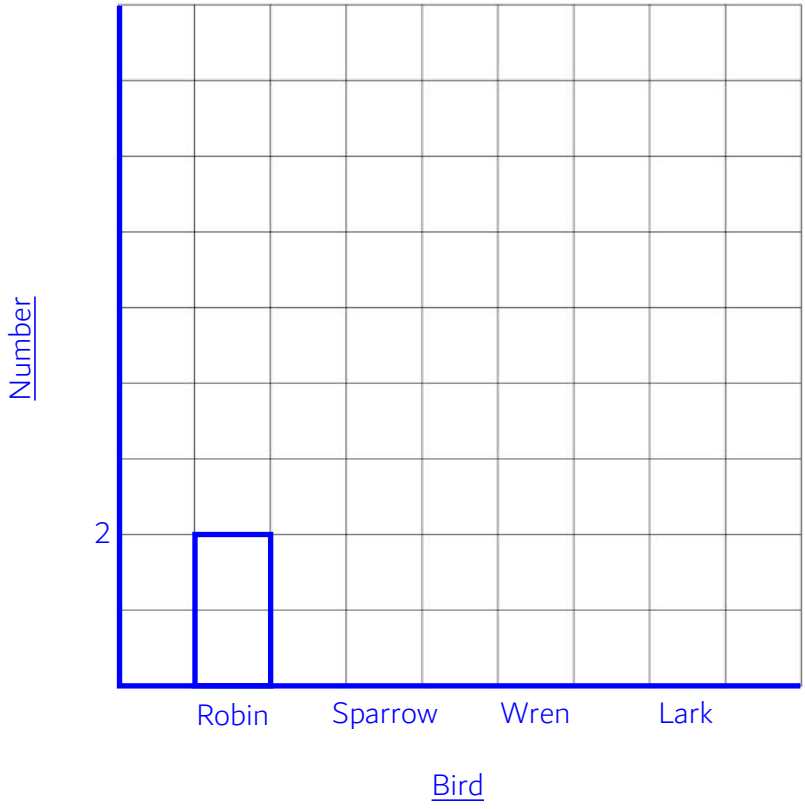
7

6 The table shows information about the birds in a garden.

Bird	Number
Robin	2
Sparrow	5
Wren	3
Lark	1

Draw a bar chart to show the information.

[3 marks]



7 Eve has these coins.

Ola has these coins.

Eve gives **three** of her coins to Ola.

Now, Ola has the same amount of money as Eve.

Which coins does Eve give to Ola?

[3 marks]

Subtracting the amount of money Ola has from the amount of money Eve has works out the difference. Halving this works out what Eve needs to give so that they have the same amount of money

Answer _____ , _____ , _____

Turn over for the next question

6

8 A dry cleaning shop has the following offers.

Suit

Normal price £12.50
1st suit normal price
2nd suit half price

Dress

Normal price £9.75
Three for the price of two

Work out the **total** price for 2 suits and 6 dresses.

[4 marks]

Adding the price of 2 suits and 6 dresses works out the total price. The first suit is 1 lot of the normal price and the second suit is 1/2 a lot of the normal price. 1 + 1/2 = $1^1/_2$ lots of the normal price. 6 dresses is 2 lots of 3 so the offer can be used twice. 2 are paid for each time the offer is used so 2 x 2 = 4 times the normal price

Answer £ _____

9 Karl has twin sisters.

The sum of the ages of Karl and his twin sisters is 39

In 4 years' time the twins will be 18

How old will Karl be in 4 years' time?

[3 marks]

In 4 year's time the twins will be 18 so 18 - 4 works out how old they currently are. Multiplying this by 2 as there are 2 twins works out the total age of the twins. Subtracting this from 39 works out Karl's current age. Adding 4 works out his age in 4 years' time

Answer _____

Turn over for the next question

7

10 One of the angles in a triangle is 60°

Tick a box for each statement.

	Must be true	**Cannot be true**	**Might be true**
The triangle is equilateral			
The triangle has at least one other acute angle			
The triangle is right-angled			
The other two angles are each less than 60°			

[4 marks]

There are 180° in total in a triangle. Equilateral triangles have three equal angles. Acute angles are less than 90°. Right angles are 90°

11 Which of these numbers has **exactly** two factors?

Circle your answer.

[1 mark]

~~6~~ 7 8 9

6 has 1, 6, 2, 3

Factors are whole numbers the number can be divided by and get a whole number result

12 Work out $\sqrt{7.5^2 + 18^2}$

Circle your answer.

Type into calculator

[1 mark]

19.5 25.5 331.5 380.25

13 (a) Use your calculator to work out the exact value of $\frac{18\,953 \times 437}{11}$

[1 mark]

Type into calculator

Answer _____

13 (b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible.

[3 marks]

To round to 1 significant figure: look at the second significant figure to decide if the first significant figure rounds up or stays the same. If the second figure is a 0, 1, 2, 3, 4 it stays the same and if it is a 5, 6, 7, 8, 9 it rounds up. Everything after the first significant figure is then set to 0 and decimal places after it are ignored. Significant figures are all digits after any 0s. The answer is sensible if it is close to the approximation

10

14 Chris sells lawnmowers.

The table shows the number he sold each quarter for three years.

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
2016	17	64	50	5
2015	9	72	61	1
2014	19	58	53	2

17 + 64 + 50 + 5 = 136

14 (a) In which year did he sell the most lawnmowers?

You **must** show your working.

[2 marks]

136 were sold in 2016

Answer _____

14 (b) He uses the table to decide the number of lawnmowers to stock each quarter.

At the **start** of which quarter should Chris stock the most lawnmowers?
Circle your answer.

[1 mark]

Quarter 1 Quarter 2 Quarter 3 Quarter 4

The Quarter with the most sold should be the one in which he stocks the most

15 In a test,

Section A has 80 marks

Section B has 120 marks.

Riya scores

55% in Section A

70% in Section B.

To pass, Riya needs to score 65% of the **total** marks.

Does she pass?

You **must** show your working.

[4 marks]

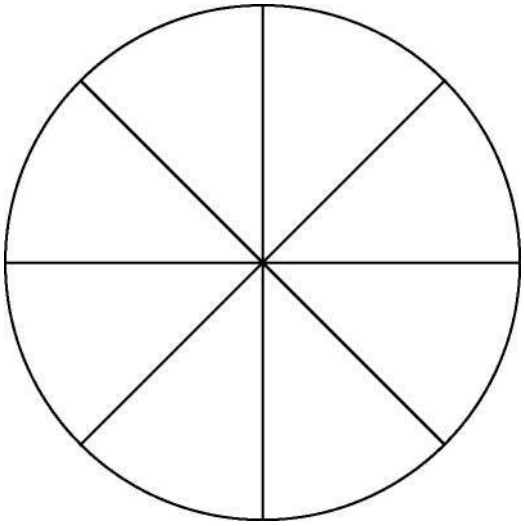
55% of the 80 marks add 70% of the 120 marks works out how many marks were scored in total. 'Of' means to multiply. Adding the 80 and the 120 works out how many marks there are in total. Doing 65% of this works out how many marks are needed to pass

To get the percentage symbol in the calculator, press SHIFT then the ANS button

Answer _____

7

16 A wheel is made of a circular rim and 8 spokes as shown.



Not drawn accurately

The length of each spoke is 37 cm

Work out the **total** length of the rim and spokes.

[3 marks]

The length of the rim is the circumference of the circle. Circumference = π x diameter. Diameter = 2 x radius. The length of each spoke is the radius. Add the length of all 8 spokes combined to the length of the rim to get the total length

Answer _____ cm

17 Here is a formula to convert degrees Celsius (°C) to degrees Fahrenheit (°F).

$$F = 1.8C + 32$$

F is the number of degrees Fahrenheit

C is the number of degrees Celsius

17 (a) Show that –40°C = –40°F

[2 marks]

The formula has F as the subject so substituting -40 for C in the right side converts -40°C to Fahrenheit

17 (b) The temperature is –15°C

Nick says,

"Because the temperature is negative in Celsius, it **must** be negative in Fahrenheit."

Is he correct?

You **must** show your working.

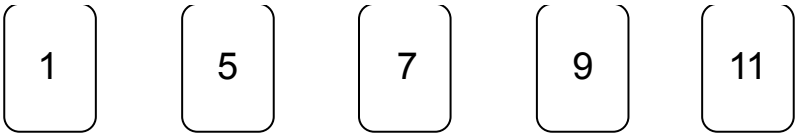
[1 mark]

Substituting -15 for C in the formula converts -15°C into Fahrenheit

Answer _____

6

18 Here are five cards.



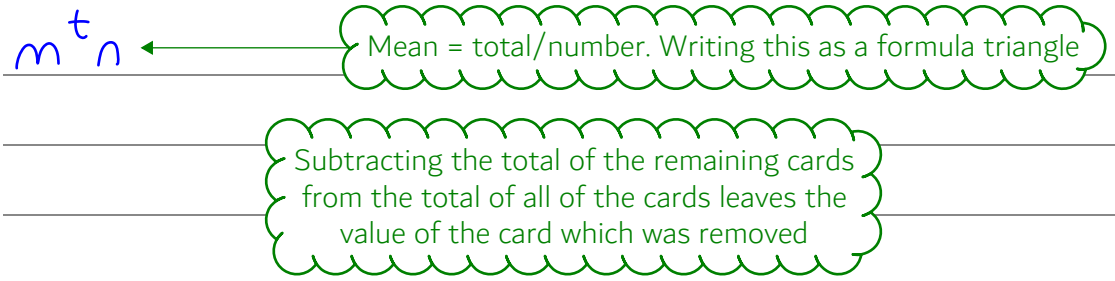
One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

[3 marks]



Answer _____

19 (a) Divide 120 in the ratio 1 : 4

[2 marks]

Work out how many parts there are in total. This many parts represents the 120 so dividing 120 by this works out the value of 1 part. Then multiplying the value of 1 part by 4 works out the value of the 4 parts

Answer _____ : _____

19 (b) Write the ratio 7 : 4 in the form n : 1

[1 mark]

To make an equivalent ratio, all sides of the ratio need to be multiplied or divided by the same amount

Answer _____ : _____

Turn over for the next question

6

20 In 2015, Han was paid £1350 per month.

In 2016, he

had a 2% increase in his monthly pay

worked 37.5 hours per week

worked for 47 weeks.

Work out Han's average pay **per hour** for 2016

[5 marks]

Pay per hour for 2016 means pay for 2016 divided by the number of hours worked. 100 + 2 works out the percentage the monthly wage rises to. Dividing this by 100 converts it into a fraction which when the £1350 is multiplied by increases it by 2%. Multiplying the monthly pay in 2016 by 12 as there are 12 months in a year so this works out the total pay for 2016. 37.5 x 47 works out the number of hours worked in 2016

Answer £ _____

21 An experiment is carried out 200 times.

The possible outcomes are K, L and M.

21 (a) Complete the table.

[2 marks]

Outcome	K	L	M
Frequency	84	54	
Relative frequency	0.42		

Subtracting the frequency of K and L from the number of times the experiment was carried out must leave the frequency of M. The relative frequency can be left as a fraction of the amount of times each outcome happened

21 (b) Altogether, the experiment is carried out 500 times.

How many times would you expect the outcome to be K?

[2 marks]

The relative frequency is the proportion of the times each outcome happened. We can assume that the relative frequency will stay the same for more experiments. Doing this proportion of the 500 times works out an estimate of the number of times K will happen

Answer _____

Turn over for the next question

9

22 The table shows information about the UK and Germany.

	Population	Area (square miles)
UK	64 000 000	95 000
Germany	82 000 000	140 000

Population density = $\frac{\text{population}}{\text{area}}$

Compare the population densities of the UK and Germany.

[3 marks]

Compare the population densities by making a statement about which country has the greatest

23 Which **one** of the following is discrete data?

Circle your answer.

[1 mark]

Mass of a television

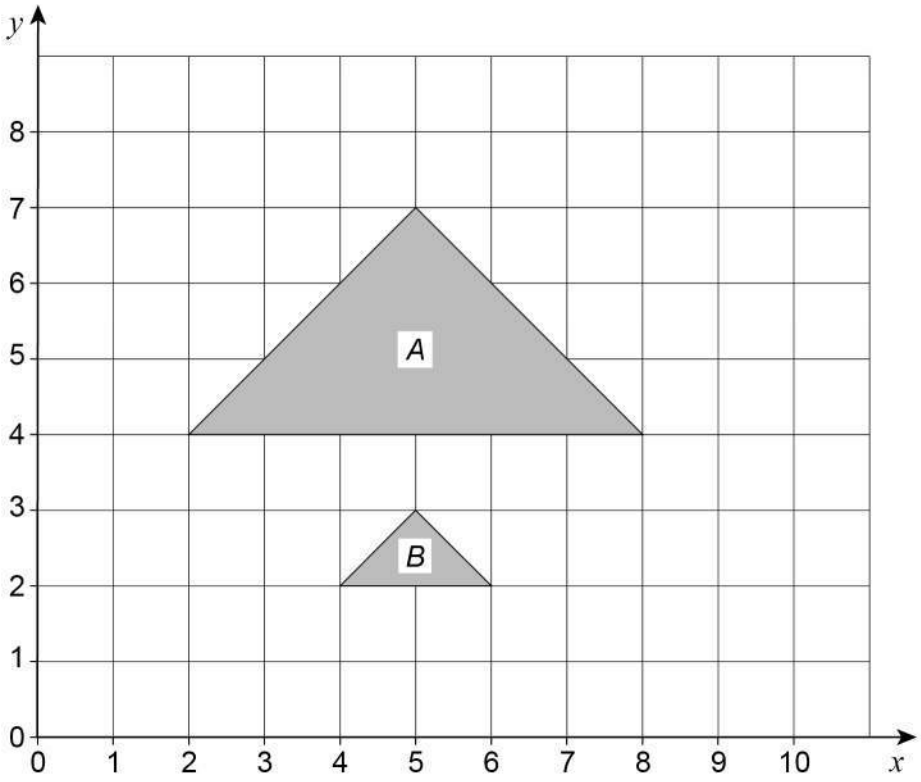
Time taken to deliver a television

Height of a television mast

Number of televisions sold

Discrete data can only be certain values. It cannot be any value (for example it might not be able to be a fraction or decimal)

24 Describe fully the **single** transformation that maps triangle *A* to triangle *B*.



[3 marks]

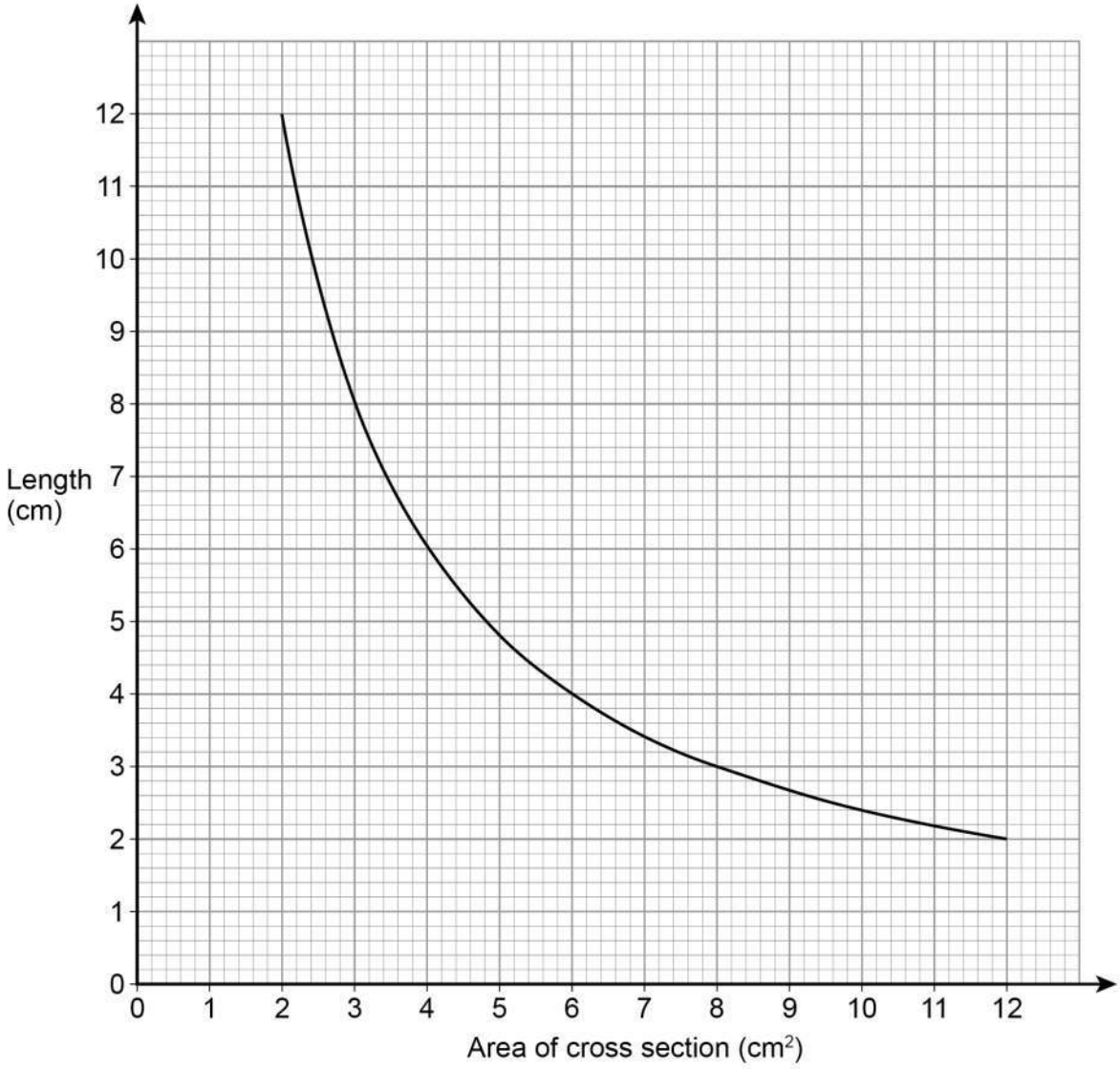
Enlargement, scale factor ... , centre ...

Turn over for the next question

It is an enlargement as it has changed size. The scale factor is the amount the sides on A have been multiplied by to get the sides on B. Drawing lines through the corners of both shapes then finding where they cross works out the coordinates of the centre of enlargement

7

25 The graph shows information about prisms with the same volume.



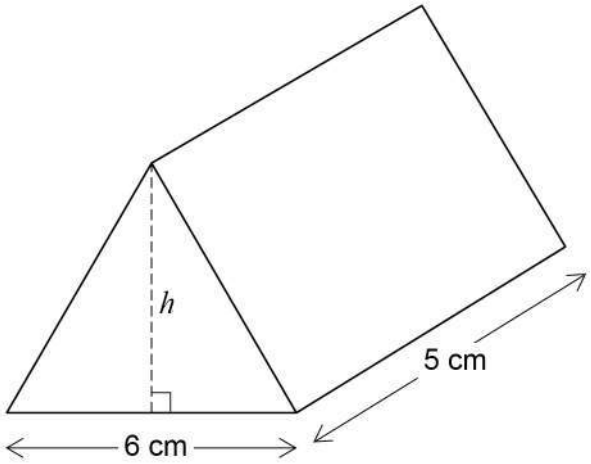
25 (a) Give **one** example to show the volume is 24 cm^3

[1 mark]

Volume of prism = area of cross section x length. Picking any point on the curve and multiplying the area of cross section by the length will give 24

25 (b) The diagram shows a prism with volume 24 cm^3

The height of the triangular cross section is h.



Work out the height, h.

[3 marks]

Read from the graph to find the area of cross section for a prism with volume 24cm^2 and length 5cm. The cross section is a triangle and area of triangle = 1/2 x base x height. The base is 6cm and the height is h. Form an equation then rearrange to find h

Answer _____ cm

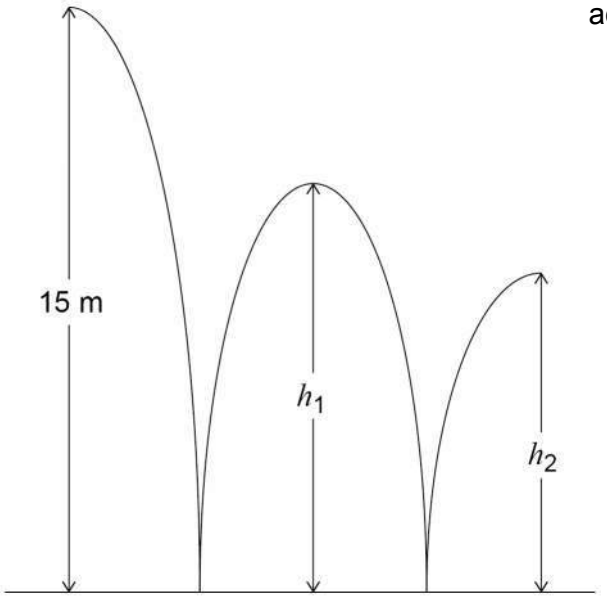
Turn over for the next question

4

26 A ball is thrown from a height of 15 metres.

It bounces to height h_1, then to height h_2 as shown.

Not drawn accurately



h_1 is three quarters of the original height.

26 (a) Jack expects h_2 to be three quarters of h_1

Work out the value of h_2 that he expects.

[2 marks]

Doing 3/4 of 15m works out h1. 'Of' means to multiply

Answer _____ metres

26 (b) In fact, h_2 is two thirds of h_1

How does this affect the answer to part (a)?

Tick a box.

☐ The ball bounced higher than he expected

☐ The ball bounced lower than he expected

Show working to support your answer.

[2 marks]

Repeat the calculation done in part (a) but do 2/3 of h1 instead. If the value calculated now is more than in part (a), the ball bounced higher than he expected

Turn over for the next question

4

27 Solve $4(3x - 2) = 2x - 5$

[3 marks]

Expand the bracket. Collect the x terms on the side with the most x. Get the x term on its own. Then get x on its own. Do the opposite operation to both sides to get rid of something

$x =$ _____

28 Work out the next term of this quadratic sequence.

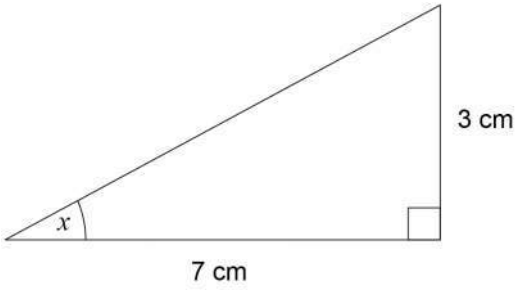
[2 marks]

5 8 14 23 ……

Answer _____

29 Work out the size of angle x.

Not drawn accurately



[2 marks]

SOHCAHTOA

Right angled trigonometry can be used. Tick what sides we have to decide which formula triangle can be used. Covering over what needs to be found works out how to find it. S: sin of the angle. C: cos of the angle. T: tan of the angle. O: opposite. H: hypotenuse. A: adjacent.

Answer _____ degrees

END OF QUESTIONS

7