

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)**

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**Tuesday 5 November 2019**

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/1F**

**Mathematics**

**Paper 1 (Non-Calculator)**

**Foundation Tier**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.  
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 not be used.**



### 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.**

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](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 down the value of the 7 in the number 1074

The 7 is in the tens place

(Total for Question 1 is 1 mark)

- 2 Write 4.58 correct to 1 decimal place.

The digit in the first decimal place needs to be rounded by considering the digit in the second decimal place. If it is a 0, 1, 2, 3, 4 it causes it to round down and stay the same. If it is a 5, 6, 7, 8, 9 it causes it to round up. Everything after the first decimal place is then set to 0 and ignored

(Total for Question 2 is 1 mark)

- 3 Work out  $31.7 \times 100$

Multiplying by 100 moves the decimal point twice to the right

(Total for Question 3 is 1 mark)

- 4 Write the fraction  $\frac{28}{70}$  in its simplest form.

To simplify a fraction divide both the numerator and denominator by a common factor. Keep dividing until they cannot get any smaller without being decimals

(Total for Question 4 is 1 mark)

- 5 Write 15% as a decimal.

To convert a percentage to decimal divide it by 100.  
This moves the decimal point twice to the left

(Total for Question 5 is 1 mark)

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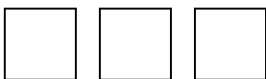


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6 The pictogram shows information about the number of pictures sold in an art shop in each of January, February and March.

|                 |   |
|-----------------|---|
| <b>January</b>  |  |
| <b>February</b> |  |
| <b>March</b>    |  |
| <b>April</b>    |   |

**Key:**

 represents 8 pictures

(a) Write down the number of pictures sold in January.

There are 3 whole symbols and each one represents 8 pictures

..... (1)

12 pictures were sold in April.

(b) Show this information on the pictogram.

Divide 12 by 8 to see how many lots of 8 it is. This many symbols need to be drawn

(1)

(c) What was the total number of pictures sold in these four months?

Count the number of symbols in total for these four months then multiply by 8

..... (2)

**(Total for Question 6 is 4 marks)**

7 Work out the difference, in minutes, between 1 hour 25 minutes and  $1\frac{1}{4}$  hours.

Difference = largest - smallest. There are 60 minutes in an hour. Work out how many minutes the  $\frac{1}{4}$  of an hour is

..... minutes

**(Total for Question 7 is 2 marks)**

8 Prasha has five blocks of wood.

The total weight of all five blocks of wood is 3 kilograms.  
4 of the blocks of wood each have a weight of 650 grams.

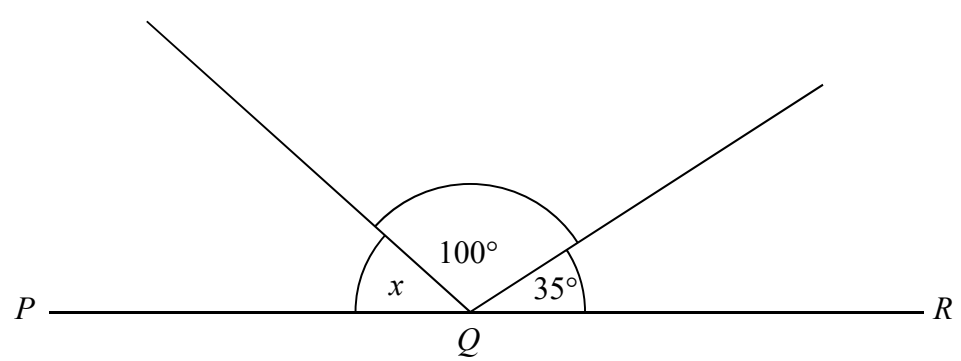
Work out the weight, in grams, of the other block of wood.

Multiplying the 650g by 4 works out the total weight of the 4 blocks of wood.  
Subtracting the weight of the 4 blocks from the total weight, in grams, of all five leaves the weight of the other block of wood. There are 1000g in 1kg

..... grams

(Total for Question 8 is 3 marks)

9  $PQR$  is a straight line.



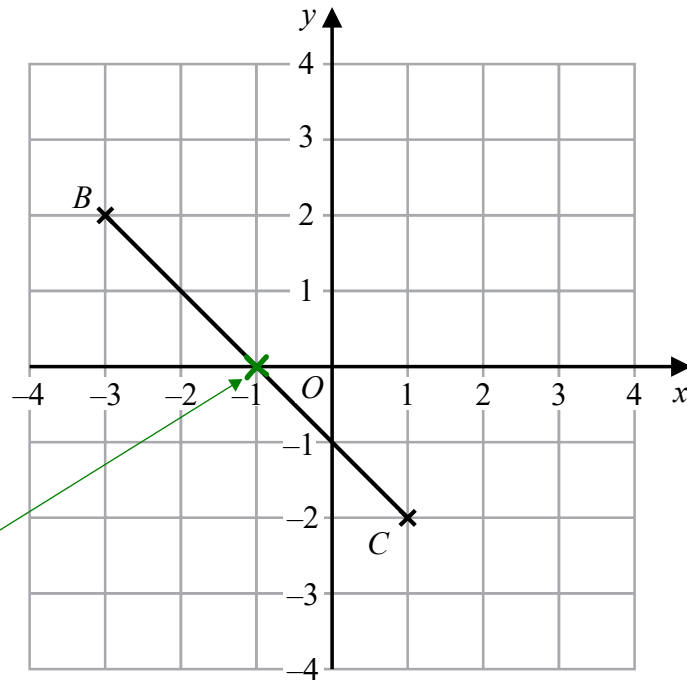
Work out the size of angle  $x$ .

There are  $180^\circ$  in total around a point on a straight line

.....

(Total for Question 9 is 2 marks)

10



The midpoint  
of BC is here

- (a) Plot the point with coordinates (3, 2)  
Label this point *A*.

3 is the x coordinate and 2 is the y coordinate

(1)

- (b) Write down the coordinates of the midpoint of *BC*.

(....., .....)

(1)

(Total for Question 10 is 2 marks)

- 11 Mason throws a coin 3 times.  
The outcome of each throw is either Heads or Tails.

List all the possible outcomes of the 3 throws.

HHH, HHT...

Use systematic listing

(Total for Question 11 is 2 marks)

12 Rehan is on holiday in the USA.

He has \$200 to spend on clothes.

Rehan buys

- 1 pair of trainers costing \$60
- 3 T-shirts costing \$25 each.

He also wants to buy a jacket costing \$80

- (a) Has Rehan got enough money to buy the jacket?  
You must show how you get your answer.

Work out the total cost of the 3 t-shirts by multiplying the \$25 by 3.  
Subtracting the cost of the trainers and 3 t-shirts from the amount of money he has leaves the amount of money he has left for the jacket

(3)

The trainers cost \$60

The exchange rate is  $\$1 = \pounds 0.749$

Rehan says,

“The trainers cost less than £40”

Rehan is wrong.

- (b) Using a suitable approximation, show working to explain why.

Multiplying the cost in dollars by the amount of pounds each dollar is worth works out the cost in pounds. Round the exchange rate down to an easier amount to work with. The cost in pounds should be more than £40

(2)

(Total for Question 12 is 5 marks)

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13 (a) Simplify  $2a \times 5b$

The multiplication can be done in any order so the  $2 \times 5$  can be done first. Then the letters can be written next to the 10 to mean that they are multiplied

(1)

(b) Simplify  $3x + 2y + 5x - y$

Simplify by collecting the like terms

(2)

(Total for Question 13 is 3 marks)

14 Work out  $23 \times 15$

$$\begin{array}{r} 23 \\ \times 15 \\ \hline \end{array}$$

Use column multiplication

(Total for Question 14 is 2 marks)

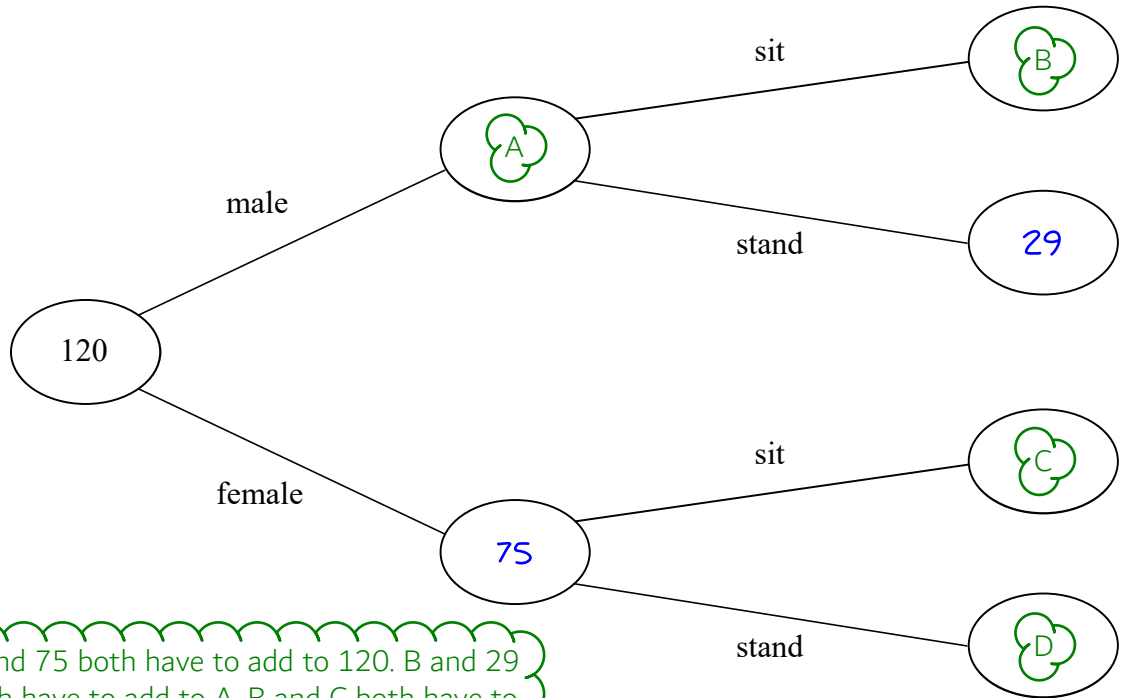


15 120 people were at a hockey match.

Each person was asked if they wanted to stand or to sit to watch the match.

75 of the people were female  
 29 of the males wanted to stand  
 30 of the people wanted to sit

(a) Use this information to complete the frequency tree.



A and 75 both have to add to 120. B and 29 both have to add to A. B and C both have to add to 30. C and D both have to add to 75

(3)

One of the 120 people is chosen at random.

(b) Write down the probability that this person is a male who wanted to stand.

29 out of the 120 people were male who wanted to stand

(1)

(Total for Question 15 is 4 marks)

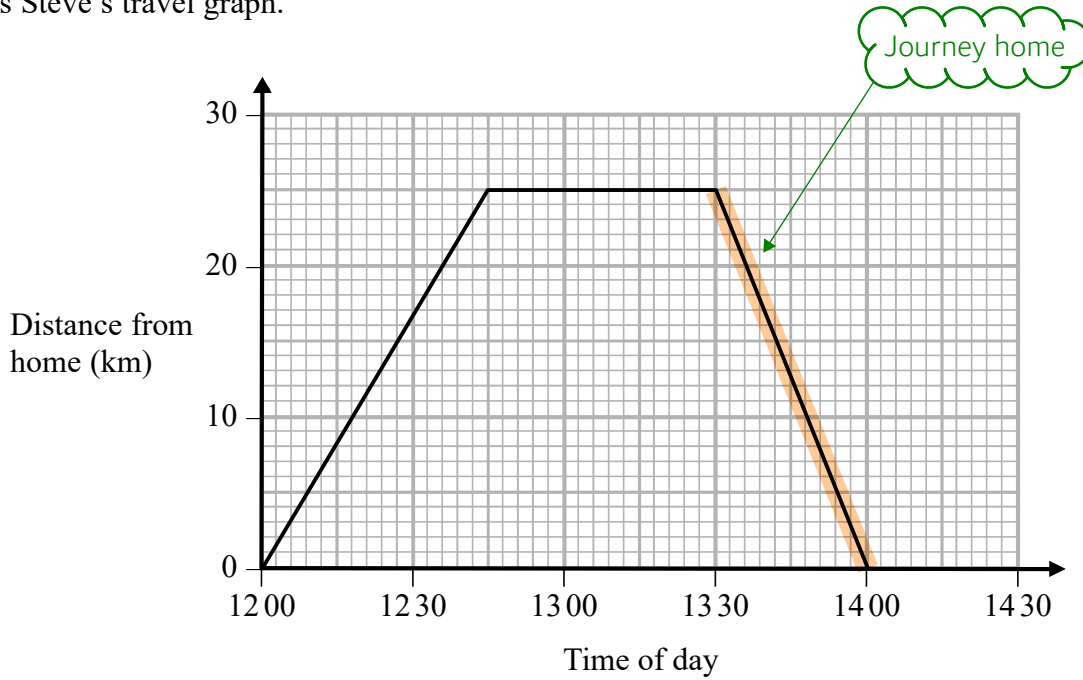
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16 Steve drove from his home to his friend's house. He stayed at his friend's house and then drove home.

Here is Steve's travel graph.



(a) For how many minutes did Steve stay at his friend's house?

The scale goes up 30 minutes over 10 small boxes.  $30/10 = 3$  so each small box is worth 3 minutes. He must be at his friend's house when his distance isn't changing

..... minutes  
(1)

(b) What was Steve's average speed on his journey home?

The unit of km/h means to divide the number of kilometres travelled by the time taken in hours. There are 60 minutes in an hour; use this to convert the minutes into hours. To divide by a fraction, keep the first part, change the symbol to multiplication, and flip the second fraction

..... km/h  
(2)

(Total for Question 16 is 3 marks)

17  $x - 1 = 2$

Work out the value of  $2x^2$

Rearrange the equation to make  $x$  the subject. Do the opposite operations to both sides to eliminate everything apart from  $x$  on the left. Then substitute the value of  $x$  into  $2x^2$

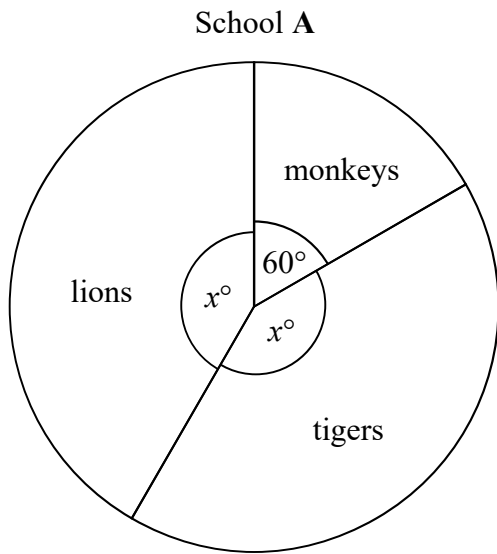
(Total for Question 17 is 3 marks)

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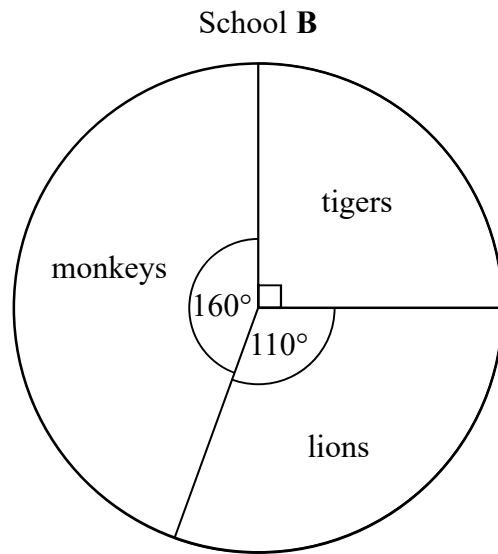
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18 The pie charts show information about the favourite animal of each student at school A and of each student at school B.



There are 480 students at school A.



There are 760 students at school B.

Henry says,

“The same number of students at each school have tigers as their favourite animal.”

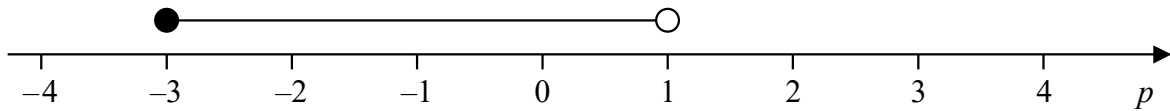
Is Henry correct?

You must show how you get your answer.

There are  $360^\circ$  in total in a pie chart. Subtracting the  $60^\circ$  leaves the number of degrees for both of the  $x$  angles. These are both equal so the result can be divided by 2 to work out one of the  $x$  angles. Express the number of degrees representing the tigers for each school as fractions of 360 then simplify the fractions by dividing the numerators and denominators by common factors. Work out these simplified fractions of the total number of students in each school to work out how many have tigers as their favourite animal. To do a fraction of an amount, divide the amount by the denominator then multiply the result by the numerator

(Total for Question 18 is 4 marks)

19 Here is a number line.

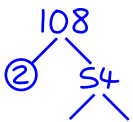


Write down the inequality shown on the number line.

The line goes to the right of -3 so  $p$  is greater than -3.  $p$  can also be equal to -3 as the dot is closed. The line goes to the left of 1 so  $p$  is less than 1.  $p$  cannot be equal to 1 as the dot is open

(Total for Question 19 is 2 marks)

20 Find the Lowest Common Multiple (LCM) of 108 and 120



Do factor trees for both 108 and 120 to express them as product of prime factors in index form. The Lowest Common Multiple is the highest power of each prime multiplied together

(Total for Question 20 is 3 marks)

- 21 There are 60 people in a choir.  
Half of the people in the choir are women.

The number of women in the choir is 3 times the number of men in the choir.  
The rest of the people in the choir are children.

the number of children in the choir : the number of men in the choir =  $n : 1$

Work out the value of  $n$ .

You must show how you get your answer.

30

Half of 60 is 30 so there are 30 women

Work out how many men there are using the fact the number of women in the choir is 3 times the number of men in the choir. Then work out the number of children using the fact the rest of the people in the choir are children. Write the ratio of men to children in the form  $M : C$ , where  $M$  is the number of men and  $C$  is the number of children. Simplify the ratio into the desired form to get 1 on the right by dividing both sides by the same amount in order to get the 1

$n = \dots\dots\dots$

(Total for Question 21 is 4 marks)

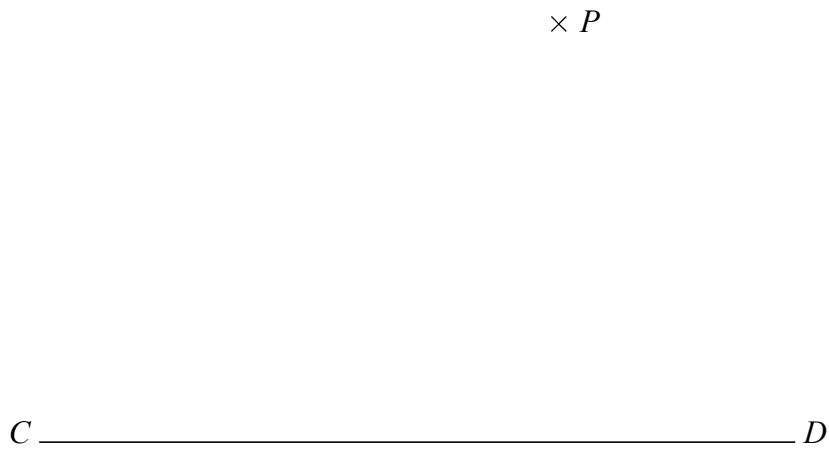
- 22 Work out  $1\frac{3}{4} \times 1\frac{1}{3}$

Give your answer as a mixed number.

Convert the mixed numbers into improper fractions by multiplying the whole numbers by the denominators then adding the results to the numerators. This makes it easier to multiply. Multiply the improper fractions by multiplying the numerators and denominators. Convert the result into a mixed number by dividing the numerator by the denominator to get the whole number and leave the remainder in the fraction

(Total for Question 22 is 3 marks)

- 23 Use a ruler and compasses to construct the line from the point  $P$  perpendicular to the line  $CD$ . You must show **all** construction lines.



- 1) Using a compass, scribe two arcs from point  $P$  on the line  $CD$ .
- 2) Using a compass, scribe arcs from both of the first arcs which meet below the line.
- 3) Draw a straight line using a ruler from point  $P$  through the cross

(Total for Question 23 is 2 marks)

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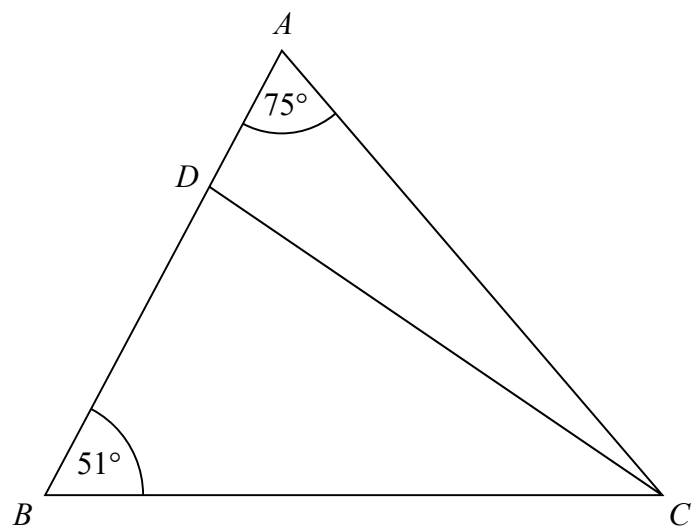
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24 The diagram shows triangle  $ABC$ .



$ADB$  is a straight line.

the size of angle  $DCB$  : the size of angle  $ACD = 2 : 1$

Work out the size of angle  $BDC$ .

Angles in a triangle add up to  $180^\circ$ . Use this fact to work out the angle  $ACB$ . This is the total of angles  $DCB$  and  $ACD$  so it can be divided into the ratio to find angle  $DCB$ . There are then two angles in triangle  $DBC$  so the missing angle,  $BDC$ , can be worked out

(Total for Question 24 is 4 marks)



- 25 4 red bricks have a mean weight of 5 kg.  
5 blue bricks have a mean weight of 9 kg.  
1 green brick has a weight of 6 kg.

Donna says,

“The mean weight of the 10 bricks is less than 7 kg.”

Is Donna correct?

You must show how you get your answer.

$m^t_n$  ←

Mean = total/number, where total is the total weight and number is the number of bricks. Writing this as a formula triangle

Using the formula triangle work out the total weight of the red bricks and the total weight of the blue bricks. Then add all of the totals together to work out the total weight of all 10 bricks. Use the formula triangle to work out the mean. If this is less than 7kg Donna is correct

(Total for Question 25 is 3 marks)

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26 (a) Simplify  $(p^2)^5$

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

.....  
(1)

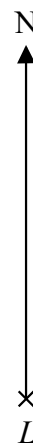
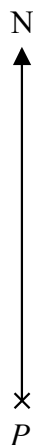
(b) Simplify  $12x^7y^3 \div 6x^3y$

Divide the 12 by the 6, the  $x^7$  by the  $x^3$  and the  $y^3$  by the  $y$ . Write all the results multiplied together.  $a^x/a^y = a^{x-y}$

.....  
(2)

**(Total for Question 26 is 3 marks)**

27 The accurate scale drawing shows the positions of port  $P$  and a lighthouse  $L$ .



Scale: 1 cm represents 4 km.

Aleena sails her boat from port  $P$  on a bearing of  $070^\circ$

She sails for  $1\frac{1}{2}$  hours at an average speed of 12 km/h to a port  $Q$ .

Find

- the distance, in km, of port  $Q$  from lighthouse  $L$ ,
- the bearing of port  $Q$  from lighthouse  $L$ .

$s^d_t$  ←

Writing the formula triangle for distance, speed and time

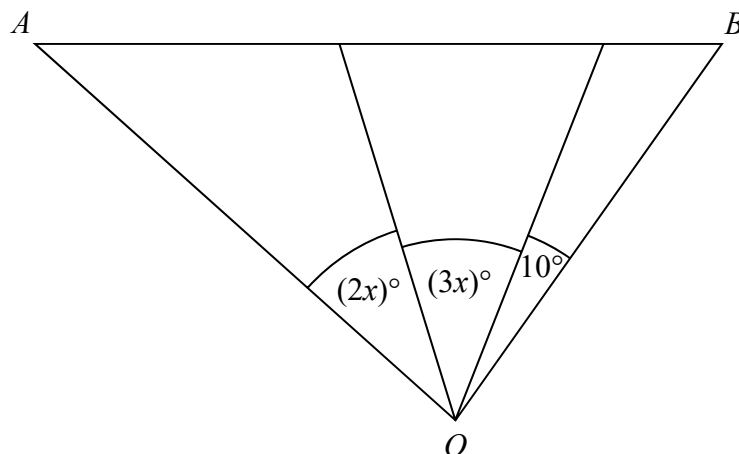
Work out the distance she sailed to port  $Q$  in kilometres. Use the scale to work out how many centimetres represent this. Measure  $70^\circ$  clockwise from north at  $P$  and draw a line of the length worked out in that direction. Port  $Q$  must be at the end of this line. Draw a straight line from the port  $Q$  to the lighthouse  $L$ . Measure its length using a ruler and use the scale to work out the actual distance in kilometres. Measure the anticlockwise angle from north at  $L$  and the line drawn. Subtract this angle from 360 to work out the bearing

distance  $QL = \dots\dots\dots$  km

bearing of  $Q$  from  $L = \dots\dots\dots^\circ$

(Total for Question 27 is 5 marks)

28 The diagram shows triangle  $AOB$ .



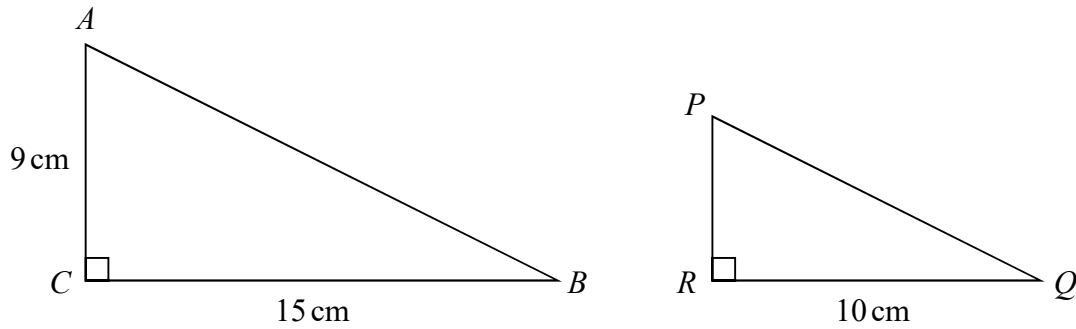
Angle  $AOB$  is **not** an obtuse angle.

Find the greatest value of  $x$ .  
You must show all your working.

$x$  is greatest when angle  $AOB$  is greatest. Obtuse angles are more than  $90^\circ$  but less than  $180^\circ$ . The angle cannot possibly be  $180^\circ$  or more as there are only  $180^\circ$  in a triangle. Adding all of the angles within  $AOB$  together and setting it equal to the greatest possible angle for  $AOB$  creates an equation in terms of  $x$  which can be solved. To solve the equation, simplify by collecting like terms then follow BIDMAS backward and do the opposite operations to both sides of the equation to eliminate everything apart from  $x$  on the one side

(Total for Question 28 is 3 marks)

29  $ABC$  and  $PQR$  are similar right-angled triangles.



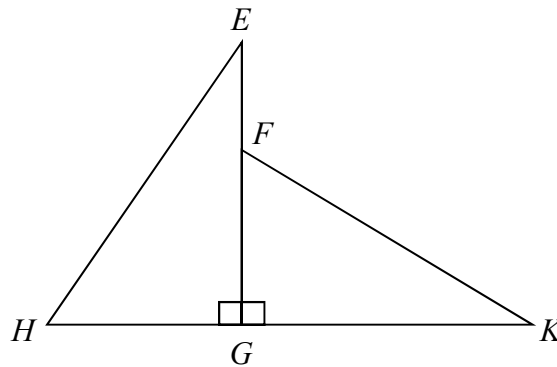
angle  $ABC =$  angle  $PQR$

(a) Work out the length of  $PR$ .

Express the fraction of the larger triangle the smaller triangle is.  $CB$  is the larger version of  $RQ$ . Simplify the fraction then do that fraction of side  $AC$ , which is the larger version of  $PR$

..... cm  
(2)

Triangle  $EGH$  is congruent to triangle  $KGF$ .



$HK = 10$  cm.

$HG = 4$  cm.

(b) Work out the length of  $EF$ .

Subtracting  $HG$  from  $HK$  works out  $GK$ , which is the same as  $GE$ .  
Subtracting  $FG$ , which is the same as  $HG$ , from  $GE$  works out  $EF$

..... cm  
(2)

(Total for Question 29 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS