Higher Maths Summer 2019 P2 Q1c

A rectangle has a length of $(x + 5)$ cm and a width of $(2x - 3)$ cm.
Its perimeter is 46 cm.

Calculate the value of x. [4]

Higher Maths Nov 2017 P2_Q3

ABC is an isosceles triangle with *AB* = *AC*.

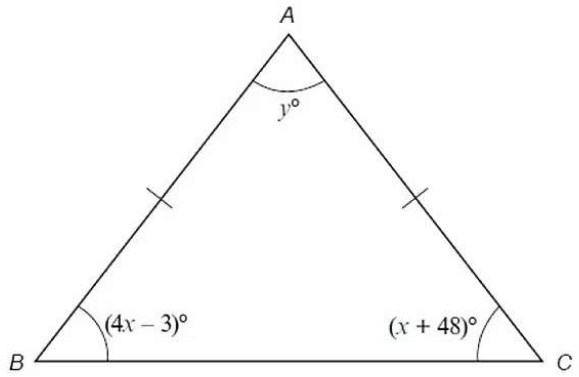


Diagram not drawn to scale

Calculate the value of y. [6]

Higher Numeracy Sample 2 P2 Q1

A ribbon is tied around **all** the faces of a box, as shown in the picture.
The ribbon is placed across **each** face of the box and meets all the edges of the box at right angles.
A bow is tied on top of the box.

(a) A box has length 8·5 cm, width 4·6 cm and height 2·2 cm.
The bow is made using 18 cm of ribbon.
Calculate the total length of ribbon required.

[3]

(b) A different box is to be decorated with ribbon in the same way.
The box has length l cm, width w cm and height h cm.
The bow is made using 18 cm of ribbon.
Write down an expression for the total length of ribbon needed to decorate this box.

[2]

Higher Numeracy Summer 2017 P1 Q3

Bethan builds a rectangular sheep pen.

(a) The perimeter fence of the sheep pen is 18 m long.
It costs her £1.10 for every 0·5 metres of fencing used to make the sheep pen.

(i) Calculate the cost of the fencing used to make this sheep pen. [2]

(ii) The length of Bethan's sheep pen is two times its width.
Find the length and width of this sheep pen.
You must show your working. [2]

Length is ..... metres

Width is ..... metres

(b) Bethan decides to build a new sheep pen.
The perimeter fence of the new sheep pen is 16 m long.
The length of the new sheep pen is 3 metres longer than the width.

Form an equation and solve it to find the dimensions of this new sheep pen. [3]

Length is ..... metres

Width is ..... metres

Higher Numeracy Sample 2 P1 Q4

Coffee is often sold in a carton.
The height of one coffee carton is 13·4 cm.

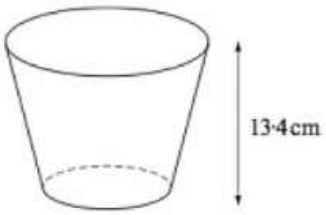


Diagram not drawn to scale

A stack of 4 empty coffee cartons is shown below.

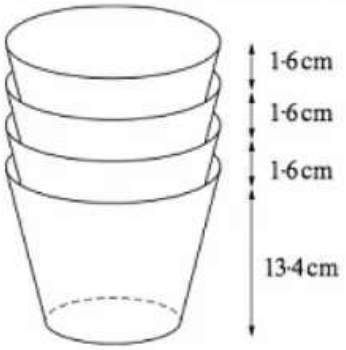


Diagram not drawn to scale

(a) What is the total height of a stack of 21 coffee cartons?
Circle your answer. [1]

32 cm 33·34 cm 33·6 cm 45·4 cm 47 cm

(b) The height of a stack of x coffee cartons is 61·4 cm.
By forming an equation, or otherwise, calculate the number of coffee cartons in the stack.

[3]

Higher Numeracy Sample 2 P1 Q6

Yolanda and Emyr set up a gardening business together.
They decide to calculate the charge for the time that they spend on a gardening job using the following method.

Gardening by Yolanda and Emyr

- START with a standard charge of £15
- ADD a fee of £10 for every **complete** hour worked
- ADD an additional fee of 20p for every **additional minute** worked
- MULTIPLY the total charge so far by 2
- EQUALS the final charge

(a) Calculate the charge for a gardening job that takes $2\frac{1}{4}$ hours.

[2]

(b)(i) The fourth bullet point in calculating the charge reads:

- MULTIPLY the total charge so far by 2.

Why do you think this is included in Emyr and Yolanda's method for calculating a charge for gardening?

[1]

(ii) Write a formula for working out the total charge, £T, for gardening that takes h hours and m minutes.

[3]

(c) Yolanda notices that there is a problem with the method for calculating the charge.
They spent 2 hours gardening for Mr Rees, and they spent 1 hour 55 minutes gardening for Ms Elmander.

Mr Rees paid less than Ms Elmander.
Explain why this happens.

[2]

Higher Numeracy Nov 2016 P1 Q5

Petra is organising a prom for her year group.
The number of people attending the prom is likely to be between 20 and 80.

The cost of holding the prom at *Hotel Afonwen* would be as follows.

- Hire of the room: £100
- Food: £15 per person
- Welcome drink on arrival: £3 per person
- Decorations: £2 per person

(a) Draw a graph to illustrate the total cost of holding the prom for between 20 and 80 people.
Use the graph paper below. [4]

(b) Petra decides to share all the costs equally between the people attending.

- Let £P be the price paid per person.
- Let N be the number of people attending the prom.

Write a formula for P, in terms of N. [3]

(c) Hiring a larger room at *Hotel Afonwen* costs £200.
The cost per person for food, welcome drinks and decorations remains the same.
If the total cost is £2240, how many people attend? [2]

Higher Numeracy Sample 2 P2_Q7

7. The length of the flag shown is twice its width.

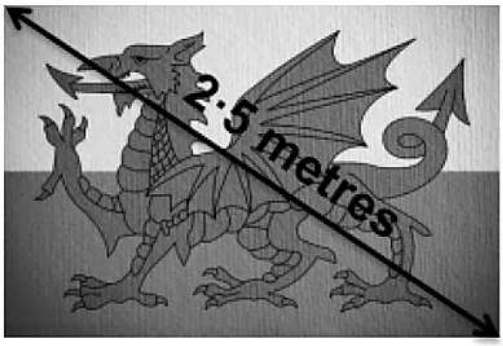


Diagram not drawn to scale

The diagonal of the flag measures 2·5 metres.
Calculate the width of the flag.

[5]

Higher Maths Sample 1 P2_Q6

An allotment has two rectangular flower beds A and B.

Flower bed A is x metres long and y metres wide.
Flower bed B is twice as long as flower bed A and is 3 metres wider than flower bed A.

The perimeter of flower bed A is 18 metres.
The perimeter of flower bed B is 34 metres.

Use an algebraic method to calculate the area of flower bed B.
You must show all your working. [6]

Higher Maths Nov 2016 P1 Q8

William has n marbles.
Lois had 4 times as many marbles as William, but she has now lost 23 of them.

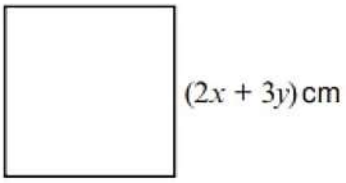
Lois still has more marbles than William.

Write down an inequality in terms of n to show the above information.
Use your inequality to find the least number of marbles that William may have. [4]

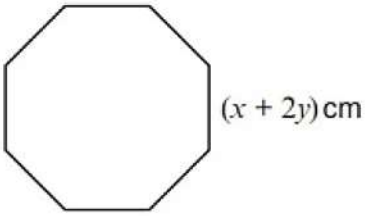
Higher Maths Nov 2016 P1_Q6

In this question you will be assessed on the quality of your organisation, communication and accuracy in writing.

Each side of a square is of length $(2x + 3y)$ cm.
The perimeter of the square is 62 cm.



Each side of a regular octagon is of length $(x + 2y)$ cm.
The perimeter of the octagon is 72 cm.



Use an algebraic method to find the value of x and the value of y. [5 + 2 OCW]

Higher Maths Nov 2018 P1 Q9

A cuboid has sides x cm, 5 cm and 7 cm.
The total surface area of the cuboid is 142 cm^2.

Form an equation in terms of x.
Solve the equation to find x. [4]

Higher Maths Summer 2018 P2_Q8

A rectangle of length 12 cm and width $(2x - y)$ cm has an area of 72 cm^2.

Diagram not drawn to scale

KLMN is a kite where $KL = 3x$ cm and $LM = y$ cm.

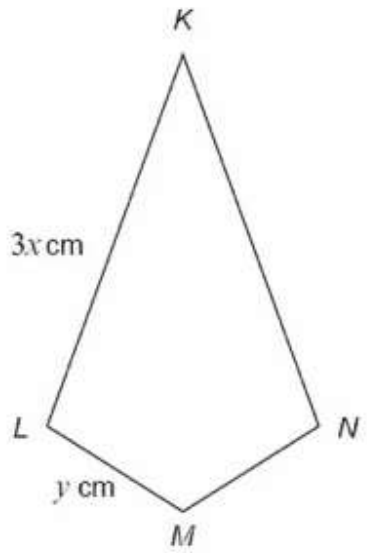


Diagram not drawn to scale

The perimeter of the kite *KLMN* = 33 cm.

Calculate the values of x and y.

You must show all your working.
Do not use a trial and improvement method. [5]

Higher Maths Sample 1 P1 Q11

You will be assessed on the quality of your organisation, communication and accuracy in writing in this question.

A cuboid with a volume of 912 cm^3 has dimensions 4 cm, $(x + 2)$ cm and $(x + 9)$ cm.

Show that $x^2 + 11x - 210 = 0$.

Solve this equation and find the dimensions of the cuboid.
You must justify any decisions that you make. [9]

Higher Maths Nov 2017 P1_Q12

Two different squares are constructed.
The side length of the smaller square is x cm.
The side length of the larger square is 3 cm longer than the side length of the smaller square.
The combined area of the two squares is 22·5 cm^2.

(a) Show that $4x^2 + 12x - 27 = 0$. [4]

(b) Find the dimensions of each of the squares.
Do **not** use a trial and improvement method.
You must show all your working and **justify** any decision that you make. [5]

Higher Maths Nov 2016 P1 Q14

Aled has three concrete slabs.
Two of the slabs are square, with each side of length x metres.
The third slab is rectangular and measures 1 metre by $(x+1)$ metres.
The three concrete slabs cover an area of $7\,m^2$.

(a) Show that $2x^2 + x - 6 = 0$. [1]

(b) Solve the equation to find the length of each side of the square slabs.
You must justify any decisions that you make. [4]

Higher Maths June 2017 P1 Q16

The diagram shows two rectangles.

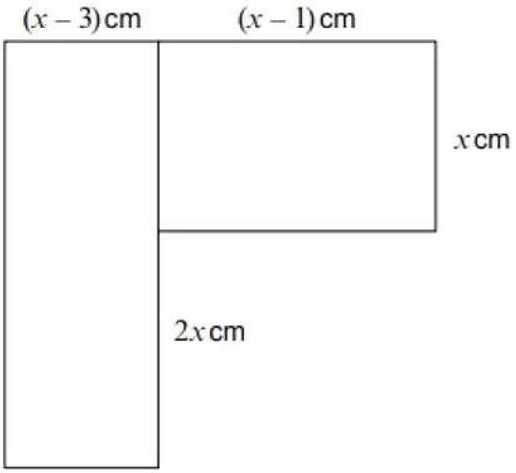


Diagram not drawn to scale

The combined area of both rectangles is $50\,cm^2$.

By considering the areas of the two rectangles, show that $2x^2 - 5x - 25 = 0$ and hence find the value of x. [6]