| Surname | |
|---|---|
| Other Names | |
| Candidate's Signature | |

# GCSE 9 - 1 Questions

## Forming and Solving Equations

## Calculator Allowed

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space provided.

- Write your answers in the spaces provided in this question paper.

- Answer ALL questions.

- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

**Total Marks :**

1)

*(a)* (i) A book costs £$b$.
In a sale, the book is half price.
Write down, in terms of $b$, the sale price of the book.

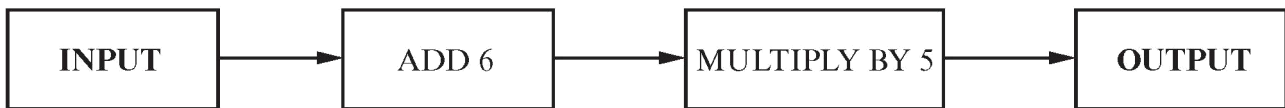......................................................................................................................................................................

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[1]

(ii) Jack's height is $x$ cm.
Asif is 4 cm taller.
Write down, in terms of $x$, Asif's height.

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[1]

*(b)* Gwyneth thinks of a number.
She adds 5 to her number.
She then multiplies the result by 4 and gets 52.
What was her number?

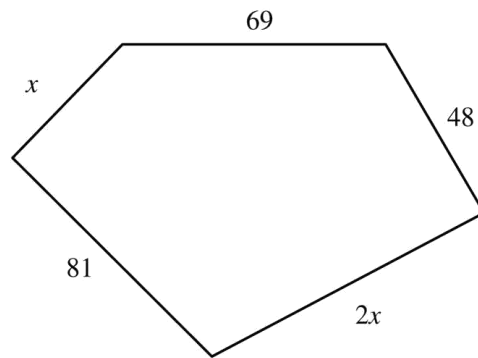......................................................................................................................................................................

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[2]

*(c)* Here is a number machine.

| INPUT | → | ADD 6 | → | MULTIPLY BY 5 | → | OUTPUT |

Write down the **OUTPUT** when the **INPUT** is $n$.

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[2]

2)

69

$x$

48

81

2$x$

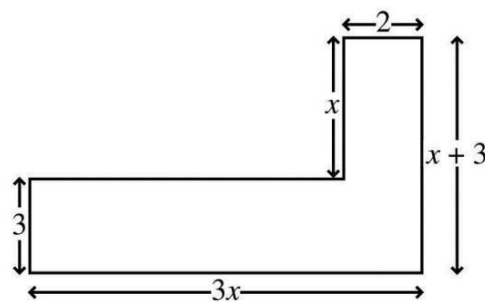(measurements in cm)

The perimeter of the pentagon is 306 cm.
Calculate the value of $x$
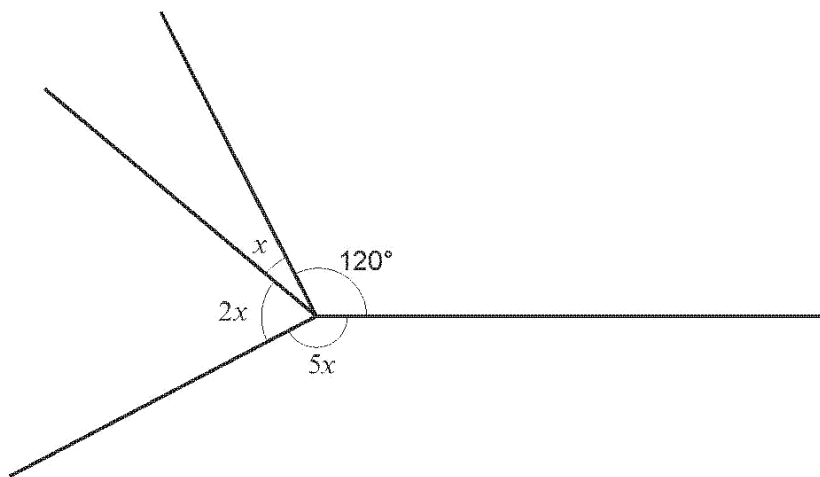
Answer $x =$_____ [4]

3)

←2→

$x$

Not drawn
accurately

$x + 3$

3

─3$x$─

The perimeter of the shape shown is 32 cm.
**Write down an equation in $x$** and solve it to find the value of $x$.

Answer $x =$ _____ [3]

4)



*Diagram not drawn to scale*

All the angles shown are measured in degrees.
Find the value of $x$ which satisfies this diagram.
You must show all your working. [3]

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5) The angles of a right angled triangle are $(2x + 10)°$, $(x + 20)°$ and $90°$.

**(a)** Write down an equation for $x$

Answer _____ [1]

**(b)** Solve this equation to find the value of $x$

Answer _____ [2]

6) Sam bought five pencils at $x$ pence each, one pen which is twice the price of a pencil and three rulers which are each 10p cheaper than a pen.
He got £7.05 change from £10

**(a)** Write down an equation in terms of $x$

Equation _____ [1]

**(b)** Solve your equation to find the value of $x$

Answer $x =$ _____ [3]

7) In a game of Foozball a player scores 2 'Goals' worth $x$ points each, 3 'Overs' worth $y$ points each and 1 'Nearly' worth $z$ points.

**(a)** Write down an expression in terms of $x$, $y$ and $z$ for the total number of points scored by this player.

Answer _____ [2]

**(b)** If the total points scored by this player were 19, how many points could each of the 3 scores have been worth?
Give **one** possible solution.

Points

1 Goal   =   _____

1 Over   =   _____

1 Nearly =   _____   [2]

8) Ben is $x$ years old. His brother Dan is 5 years younger.
   In 3 years' time the sum of their ages will be 15.

   **(a)** Write an equation in terms of $x$ using the sum of their ages in 3 years' time.

   Answer _____ [2]

   **(b)** Solve the equation to find Ben's age now.

   Answer _____ [1]

9)



A plumber has a call out fee of £35.
He then charges £20 an hour.

(a)    Find the **total cost** if the plumber works for 4 hours.

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[2]

(b)    Write down a formula to work out the plumber's **total cost** for any number of hours.

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[2]

10) **(a)** Write an expression, in terms of $x$, for the perimeter of the triangle shown. Give your answer in its simplest form.
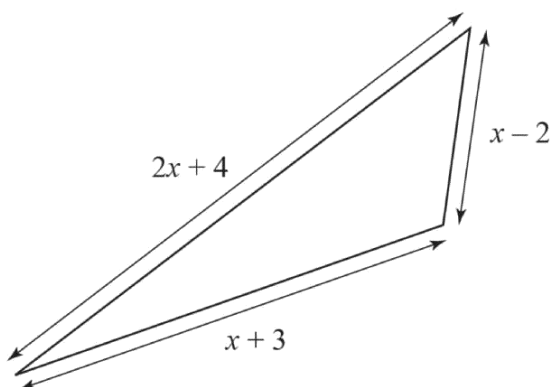


Answer _____ [2]

**(b)** The perimeter of this triangle is 29 cm.

Write down an equation for the perimeter in terms of $x$ and solve it to find $x$.

Answer $x =$ _____ [2]

11)

A pen costs $4x$ pence.
A pencil costs $2 + 3x$ pence.

The total cost of a pen and a pencil is 65 pence.
Write an equation in $x$ and solve it to find the value of $x$. [3]

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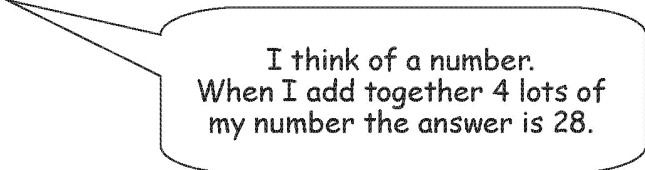
12)
Megan and Ellis play a game called "I think of a number".

(a)    Megan says

> I think of a number.
> When I add together 4 lots of
> my number the answer is 28.

Set up an equation, using the information that Megan has given.
Use the letter $n$ for the number that Megan thought of.
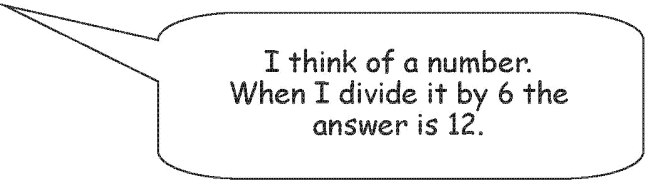Solve your equation to find the value of $n$.      [2]

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(b)    Ellis says

> I think of a number.
> When I divide it by 6 the
> answer is 12.

Set up an equation, using the information that Ellis has given.
Use the letter $m$ for the number that Ellis thought of.
Solve your equation to find the value of $m$.      [2]

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