

A013 Expressions and formula

Q1.

(a) Simplify $3f \times 5g$

.....
(1)

(b) Simplify $t \times t$

.....
(1)

(c) Simplify $\frac{2n + 6n}{2}$

.....
(1)

(Total for question = 3 marks)

Q2.

(a) Simplify $5p - 3p + p$

.....
(1)

(b) Simplify $m^3 + m^3$

.....
(1)

(c) Simplify $10 + 3c + 5d - 7c + d$

.....
(2)

(Total for question = 4 marks)

Q3.

(a) Simplify $5f - f + 2f$

.....
(1)

(b) Simplify $2 \times m \times n \times 8$

.....
(1)

(c) Simplify $t^2 + t^2$

.....
(1)

(Total for question is 3 marks)

Q4.

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

.....
(1)

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

.....
(2)

(Total for question = 3 marks)

Q5.

$$g = 9$$
$$h = 4$$

Work out the value of $2g + 3h$

.....
(Total for question = 2 marks)

Q6.

$$P = 7r + 3q$$

Work out the value of P when $r = 5$ and $q = -4$

.....
(Total for question = 2 marks)

Q7.

$$p = 3u + \frac{1}{2}t$$

$$u = -4$$

$$t = 18$$

Work out the value of p .

.....
(Total for question = 3 marks)

Q8.

$$P = 3.5x - y$$

(a) Work out the value of P when $x = 12$ and $y = 5$

.....
(2)

(b) Work out the value of P when $x = -9$ and $y = -6$

.....
(2)

(Total for Question is 4 marks)

Q9.

$$T = 3x + 4y$$

(a) Work out the value of T when $x = 5$ and $y = -7$

.....
(2)

(b) Work out the value of y when $T = 38$ and $x = 6$

.....
(2)

(Total for question = 4 marks)

Q10.

* This formula is used to work out the body mass index, B , for a person of mass M kg and height H metres.

$$B = \frac{M}{H^2}$$

A person with a body mass index between 25 and 30 is overweight.

Arthur has a mass of 96 kg.

He has a height of 2 metres.

Is Arthur overweight?

You must show all your working.

(Total for Question is 3 marks)

Q11.

Here is a rule to work out the time it takes to cook a piece of meat.

$\text{Time in minutes} = 36 \times \text{weight in kg} + 30$

A piece of meat has a weight of 4 kg.

(a) Use the rule to work out the time, in minutes, it takes to cook this piece of meat.

..... minutes
(2)

It takes 192 minutes to cook a different piece of meat.

(b) Work out the weight of this piece of meat.

..... kg
(3)

(Total for question = 5 marks)

Q12.

Dimitar has 20 sweets.

Pip also has 20 sweets.

Dimitar gives Pip x sweets.

Dimitar then eats 5 of his sweets.

Pip then eats half of her sweets.

Write expressions for the number of sweets Dimitar and Pip now have.

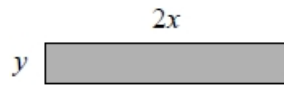
Dimitar

Pip

(Total for question = 3 marks)

Q13.

Here is a rectangle made of card.



The measurements in the diagram are in centimetres.

Lily fits four of these rectangles together to make a frame.



The perimeter of the inside of the frame is P cm.

(a) Show that $P = 8x - 4y$

(2)

Magda says,

"When x and y are whole numbers, P is always a multiple of 4."

(b) Is Magda correct?

You must give a reason for your answer.

.....
.....

(2)

(Total for question = 4 marks)

Q14.

Ben is n years old.

Chloe is twice as old as Ben.

Dan is five years younger than Ben.

The total of Ben's age, Chloe's age and Dan's age is T years.

(a) Find a formula for T in terms of n .

.....
(3)

(b) In the table below, put a tick (✓) in the box next to the identity.

$3h + 2 = 14$	<input type="checkbox"/>
$3a + 4b - 2c$	<input type="checkbox"/>
$A = \pi r^2$	<input type="checkbox"/>
$5m - 3m = 2m$	<input type="checkbox"/>
$x + 7 \leq 12$	<input type="checkbox"/>

(1)

(Total for question = 4 marks)

Q15.

You can use this rule to work out the total cost, in pounds, of hiring a carpet cleaner.

Multiply the number of days by 7.8 and then add 12

Andy hires a carpet cleaner.
The total cost is £82.20

(a) Work out the number of days Andy hires the carpet cleaner for.

..... days
(2)

Chloe hires a carpet cleaner for y days.
The total cost is £ T .

(b) Write down a formula for T in terms of y .

.....
(2)

(Total for question = 4 marks)