

# Substitution into Formulae

31 marks

1. Here is a table for a two-stage number machine.  
It divides by 2 then adds 3.  
Complete the missing numbers in the table:



Input	Output
2	4
4	5
6	.....
12	.....
.....	13

(4)  
(Total 4 marks)

2. Here is a table for a two-stage number machine.  
It multiplies by 2 then subtracts 1.  
Complete the missing numbers in the table.

$\times 2 - 1$	
Input	Output
1	1
2	3
3	.....
5	.....
.....	15

(Total 3 marks)

3. (a) Work out the value of  $2a + ay$  when  $a = 5$  and  $y = -3$

.....

(2)

- (b) Work out the value of  $5t^2 - 7$  when  $t = 4$

.....

(3)

(Total 5 marks)

4.  $S = 2p + 3q$

$$p = -4$$

$$q = 5$$

- (a) Work out the value of  $S$ .

$$S = \dots\dots\dots$$

(2)

$$T = 2m + 30$$

$$T = 40$$

- (b) Work out the value of  $m$ .

$$m = \dots\dots\dots$$

(2)

(Total 4 marks)

5.  $v = u + 10t$

Work out the value of  $v$  when

$u = 10$  and  $t = 7$

$v = \dots\dots\dots$

(Total 2 marks)

6. You can use this rule to work out the total number of points a football team got last season.

Multiply the number of wins by 3 and then add the number of draws

Last season Rovers had 10 wins and 0 draws.

(a) Use the rule to work out the total number of points Rovers got last season.

$\dots\dots\dots$

(1)

Last season United had 20 wins and 5 draws.

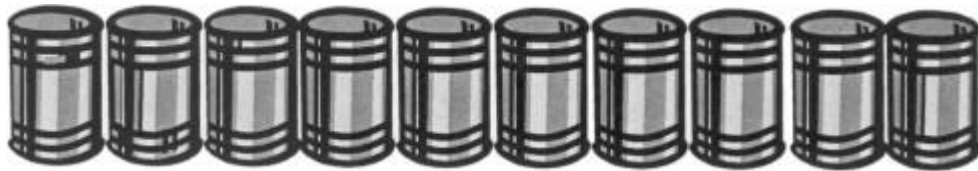
(b) Use the rule to work out the total number of points United got last season.

$\dots\dots\dots$

(2)

(Total 3 marks)

7. John tries to hit some tins at a fair.



He is given five balls to do this.

The number of points he scores is given by the formula

**Number of points =  $5 \times$  number of hits  $- 3 \times$  number of misses**

John had 3 hits and 2 misses.

Work out John's total score.

$\dots\dots\dots$  points

(Total 2 marks)

8. You can use this rule to work out the cost of a taxi journey.

$$\text{cost of taxi journey} = \text{cost per kilometre} \times \text{number of kilometres}$$

The cost per kilometre of a taxi journey is 35p.

Use the rule to work out the cost of a taxi journey of 9 km.  
Give your answer in pounds (£).

£ .....  
(Total 2 marks)

9.



Tanya picks strawberries to earn some money.  
She puts the strawberries in baskets.

The formula can be used to work out her pay.

$$\text{Pay} = \text{£15 per day} + \text{£2 for each full basket}$$

Tanya worked all day on Monday.  
She filled 12 baskets with strawberries.

Work out Tanya's pay on Monday.

£ .....  
(Total 2 marks)

10. Michelle makes dresses.  
She uses this rule to work out her pay.

Multiply the number of dresses made by £5 and add £21

Michelle made 6 dresses.

- (a) Use the rule to work out her pay.

£ ..... (2)

Andy also makes dresses.  
He is paid using the formula

$$P = 4n + 32$$

$P$  is his pay in pounds (£).

$n$  is the number of dresses he makes.

Andy made 7 dresses.

- (b) Use the formula to work out his pay.

£ ..... (2)  
(Total 4 marks)