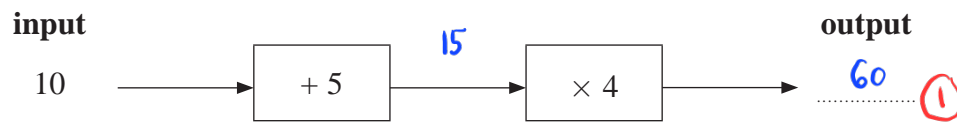
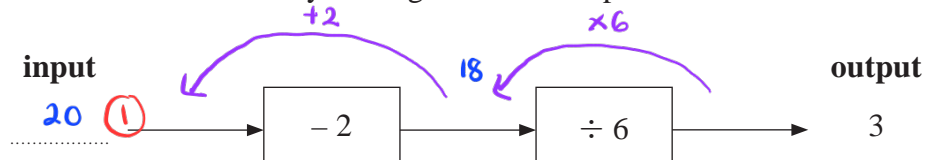


- 1 (a) Complete the number machine by writing the correct output on the dotted line.



(1)

- (b) Complete the number machine by writing the correct input on the dotted line.



① do the calculation from the back.

$\div$  becomes  $\times$

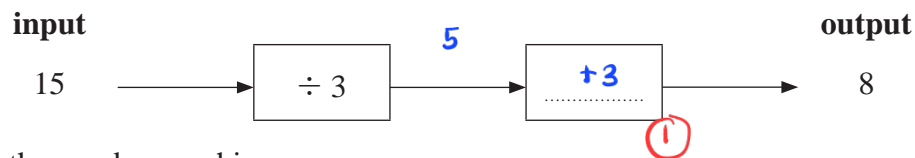
①  $3 \times 6 = 18$  ①

$-$  becomes  $+$

②  $18 + 2 = 20$

(2)

Here is an incomplete number machine.

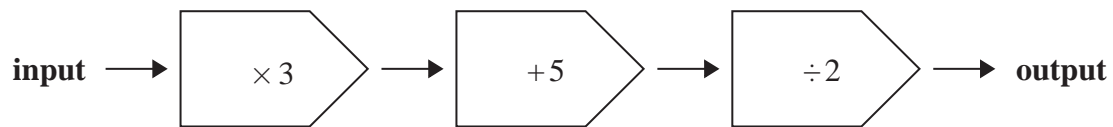


- (c) Complete the number machine.

(1)

(Total for Question 1 is 4 marks)

2 Here is a number machine.



(a) Work out the output when the input is 7

$$\begin{aligned}
 7 \times 3 &= 21 \\
 21 + 5 &= 26 \\
 26 \div 2 &= 13
 \end{aligned}$$

$$\begin{array}{r}
 13 \quad \textcircled{1} \\
 \hline
 (1)
 \end{array}$$

(b) Work out the input when the output is 160

$$\begin{aligned}
 160 \times 2 &= 320 \quad \textcircled{1} \\
 320 - 5 &= 315 \\
 315 \div 3 &= 105
 \end{aligned}$$

$$\begin{array}{r}
 105 \quad \textcircled{1} \\
 \hline
 (2)
 \end{array}$$

When the input is  $n$ , the output is  $P$ .

(c) Find a formula for  $P$  in terms of  $n$ .

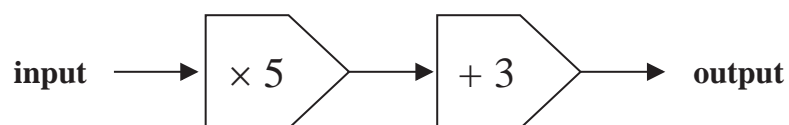
$$p = \frac{(n \times 3 + 5)}{2}$$

$$p = \frac{3n + 5}{2} \quad \textcircled{2}$$

$$\begin{array}{r}
 p = \frac{3n + 5}{2} \\
 \hline
 (2)
 \end{array}$$

(Total for Question 2 is 5 marks)

Here is a number machine.



3 (b) Work out the input when the output is 108

$$\text{input} \times 5 + 3 = 108 \quad (1)$$

$$\text{input} = \frac{108 - 3}{5}$$

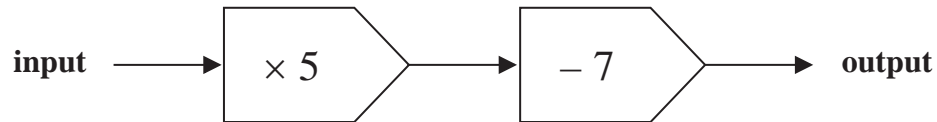
$$= \frac{105}{5} = 21 \quad (1)$$

21

(2)

(Total for Question 3 is 2 marks)

8 Here is a number machine.



(a) Work out the output when the input is 9

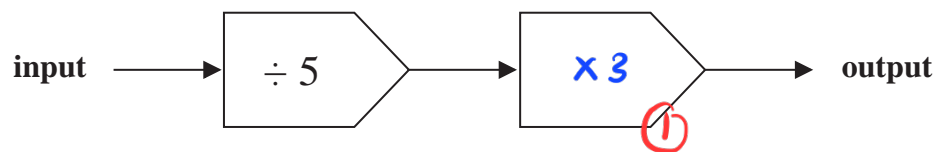
$$9 \times 5 - 7 = \text{output}$$

$$45 - 7 = 38$$

$$\begin{array}{r} 38 \quad \textcircled{1} \\ \hline \end{array}$$

(1)

Here is a different number machine.



When the input is 30 the output is 18

(b) Find a suitable way to complete the number machine.

$$\frac{30}{5} (x) = 18$$

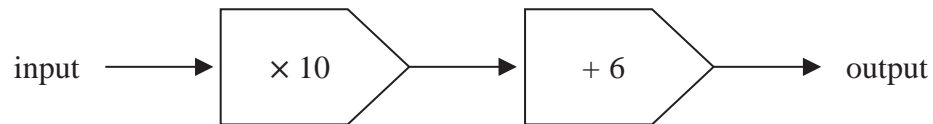
$$x = \times 3$$

(1)

The following rule is used to work out the total cost, in euros, of hiring a cement mixer.

(Total for Question 4 is 2 marks)

5 Here is a number machine.



(a) Work out the output when the input is 14

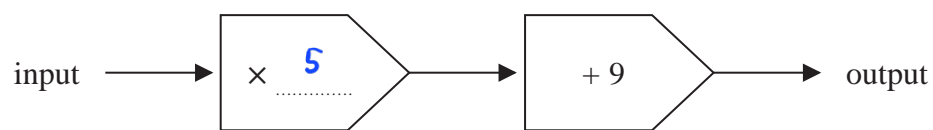
$$14 \times 10 + 6$$

$$= 146 \quad (1)$$

$$146$$

(1)

Here is a different number machine.



When the input is 11 the output is 64

(b) Write a number on the dotted line to complete the number machine.

$$11 \times m + 9 = 64 \quad (1)$$

$$11m = 55$$

$$m = \frac{55}{11} = 5 \quad (1)$$

(2)

(Total for Question 5 is 3 marks)