

Year 7 Assessment Algebraic Notation 1

Total Score /20



Name: Answers

- 1 Find the output in each of these function machine when the input is 45

$$45 \rightarrow \boxed{+6000} \rightarrow \underline{6045}$$

$$45 \rightarrow \boxed{-12.5} \rightarrow \underline{22.5}$$

- 2 Find the missing numbers for each of these function machines.

$$\underline{16} \rightarrow \boxed{\times 3} \rightarrow 48$$

$$\underline{1.6} \rightarrow \boxed{\times 3} \rightarrow 4.8$$

$$0.8 \rightarrow \boxed{\underline{60}} \rightarrow 48$$

- 3 What is the **inverse** function of this machine?

$$\rightarrow \boxed{\times 84} \rightarrow \underline{\div 84}$$

2 marks

3 marks

1 mark

- 4 Simplify these expressions.

$$6 \times 3d = \underline{18d}$$

$$e + 5e + 3e + 4e + e = \underline{14e}$$

$$12f \div 3 = \underline{4f}$$

1 mark

- 5 Write expressions to show each output.

$$\begin{array}{l} x \rightarrow \boxed{+9} \rightarrow \underline{x+9} \\ x+2 \rightarrow \boxed{+9} \rightarrow \underline{x+11} \end{array}$$

$$\begin{array}{l} x \rightarrow \boxed{\times 9} \rightarrow \underline{9x} \\ x+2 \rightarrow \boxed{\times 9} \rightarrow \underline{9x+18} \end{array}$$

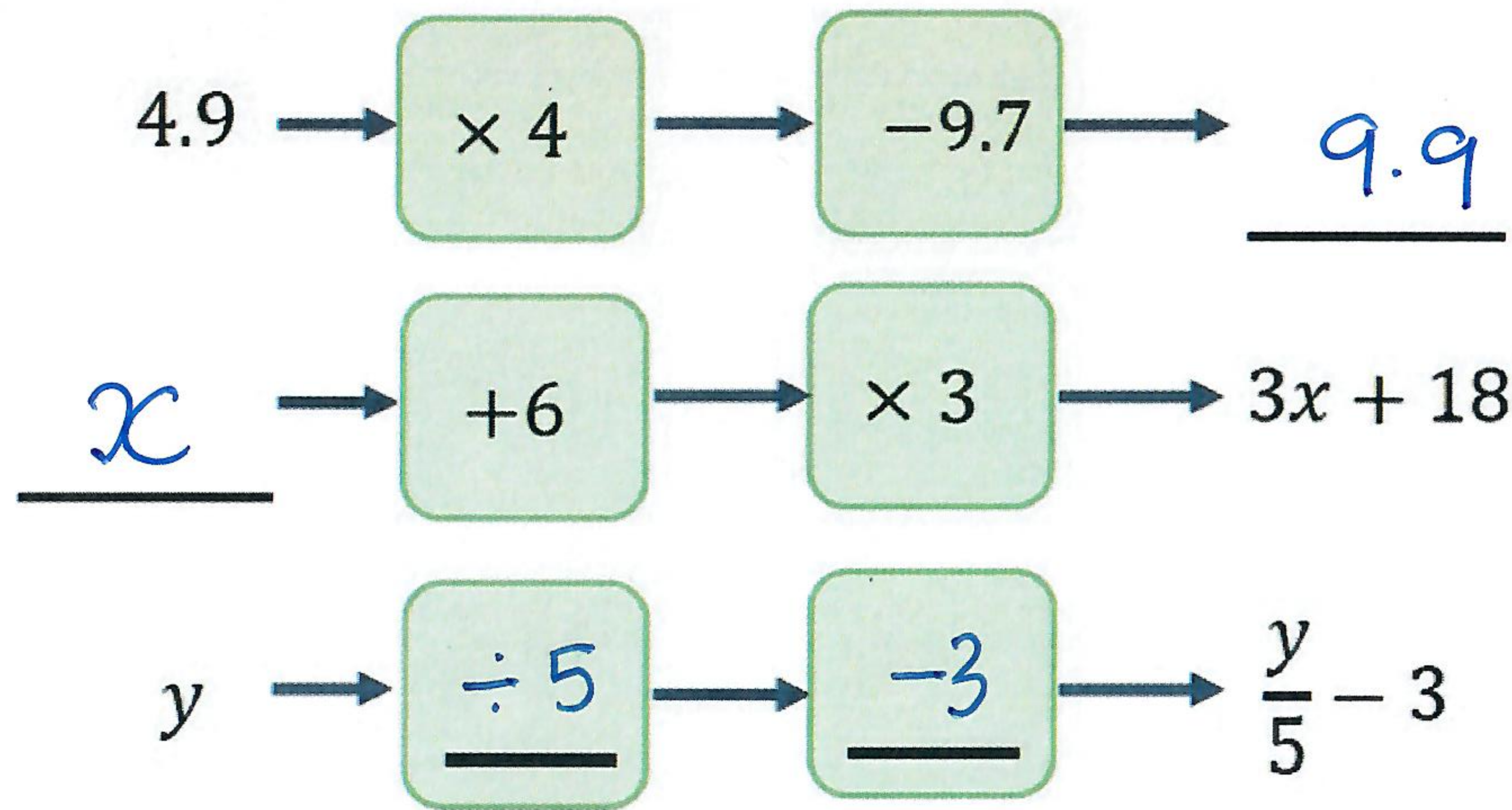
2 marks

- 6 Circle the expressions which equal one when a=15.

$$\begin{array}{ll} a - 15 & 15 - a \\ \textcircled{\frac{15}{a}} & \textcircled{\frac{a}{15}} \end{array}$$

1 mark

7 Complete the missing values.



$x = 17$ and $y = 8$

Work out the value of the expression $\frac{x+y}{5}$

$\frac{17+8}{5} = \frac{25}{5} = 5$
5

8 If the value of y increases, what will happen to the value of the expression?

It will go up.

9 Tick the equations that are straight line graphs.

$y = 9 - x$ $y = 13 + 9x$

$y = 5 - \frac{x}{3}$ $y = 7x + 3$

3 marks

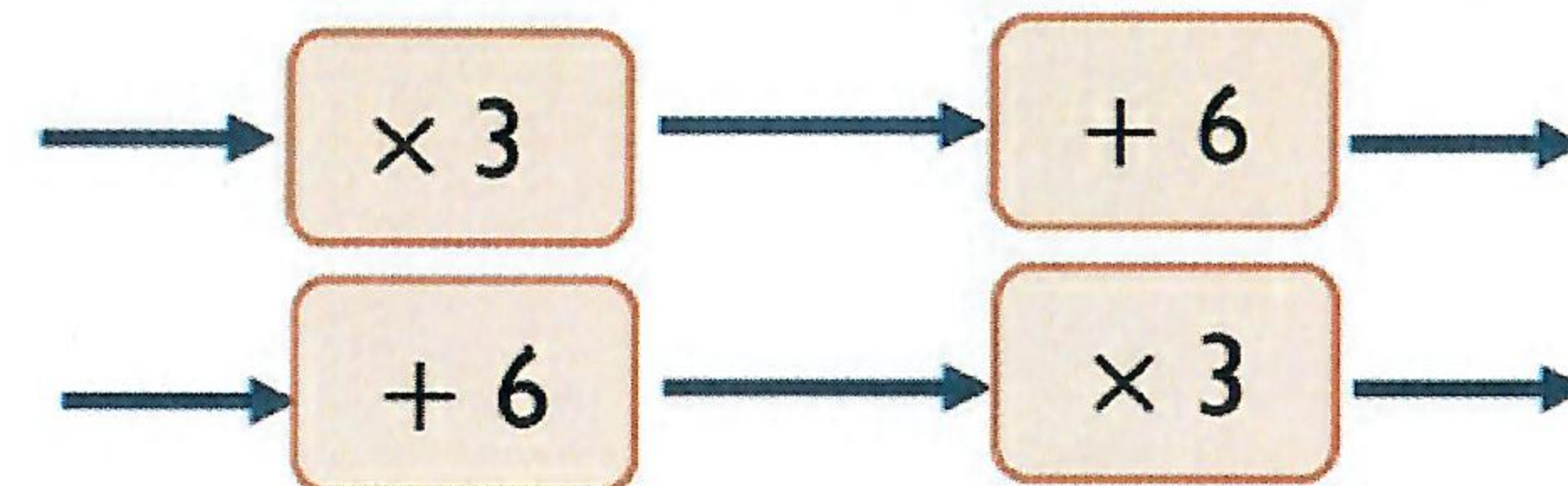
1 mark

1 mark

1 mark

10

Mia says that given the same input, both function machines will always have the same output.



Give an example to show Mia is wrong.

Lots of answers here.

*eg $(5 \times 3) + 6 = 15 + 6 = 21$
 $(5 + 6) \times 3 = 11 \times 3 = 33$*

11

Find the first three terms of these sequences.

$12 - 2n$ $n: \begin{matrix} 1 & 2 & 3 \\ \underline{10} & \underline{8} & \underline{6} \end{matrix}$

$6n + 8$ $\underline{14}, \underline{20}, \underline{26}$

Describe a difference between the two sequences.

$12 - 2n$: is decreasing in twos.

$6n + 8$: is increasing by 6 each time.

1 mark

2 marks

1 mark

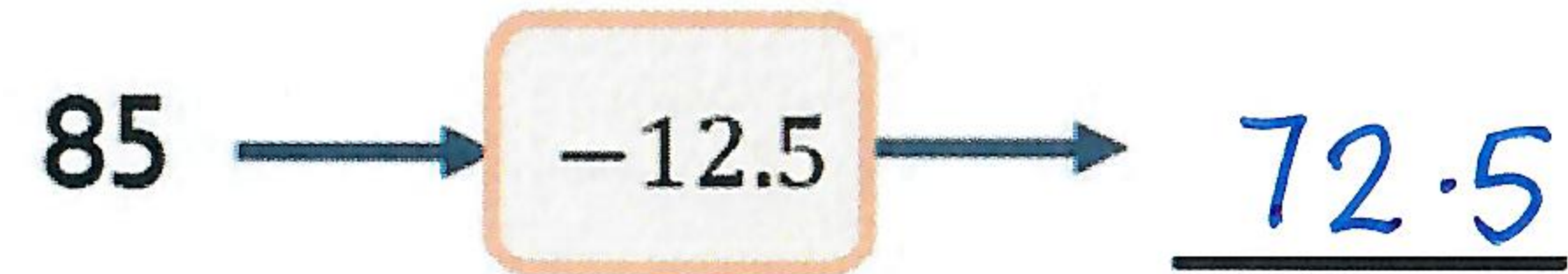
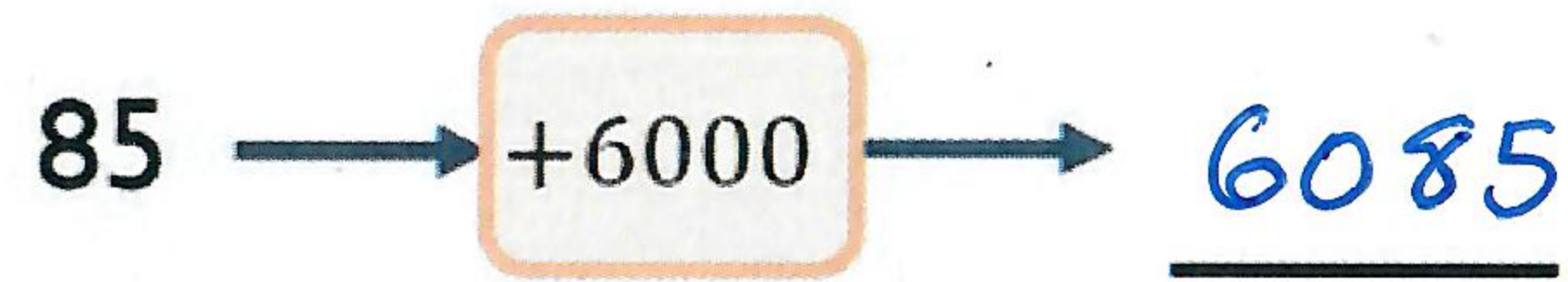
Year 7 Assessment Algebraic Notation 2

Total Score /20

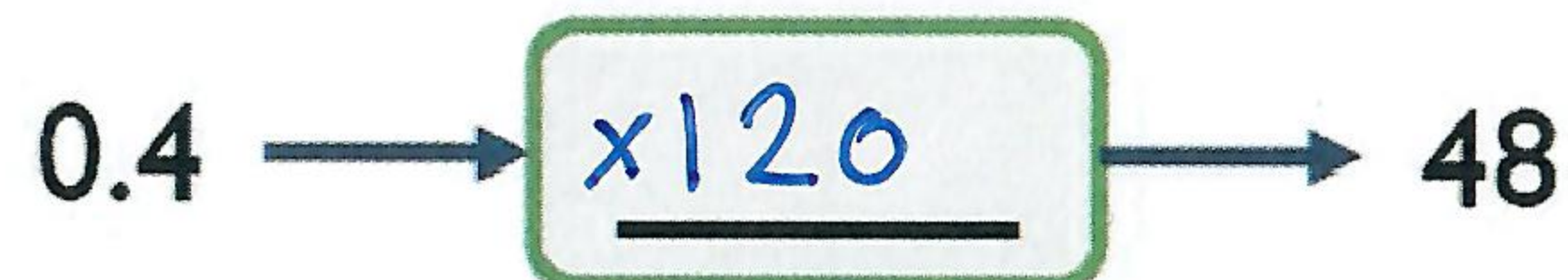
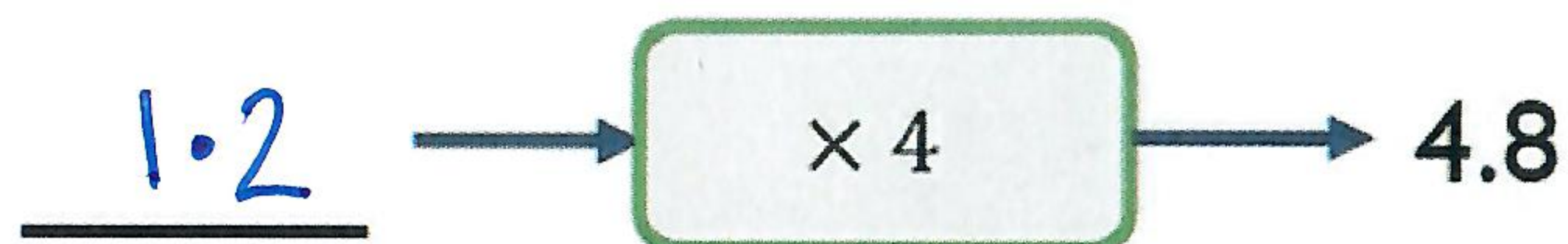
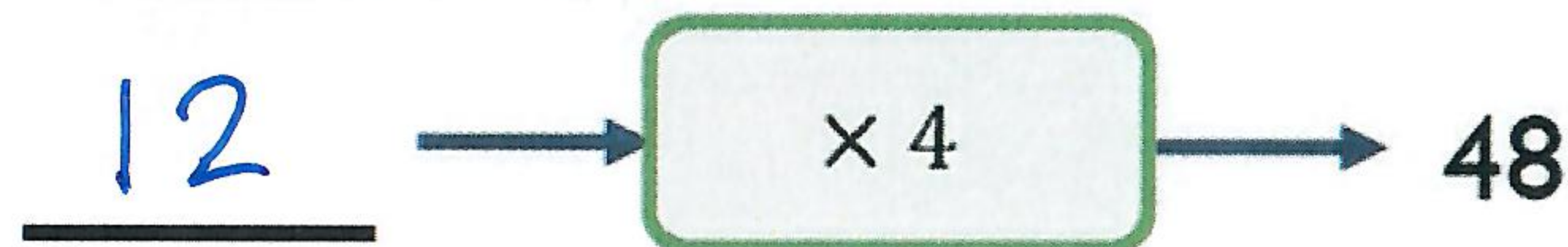


Name: Answers

1 Find the output in each of these function machines when the input is 85



2 Find the missing numbers for each of these function machines.



3 What is the **inverse** function of this machine?



2 marks

3 marks

1 mark

4 Simplify these expressions.

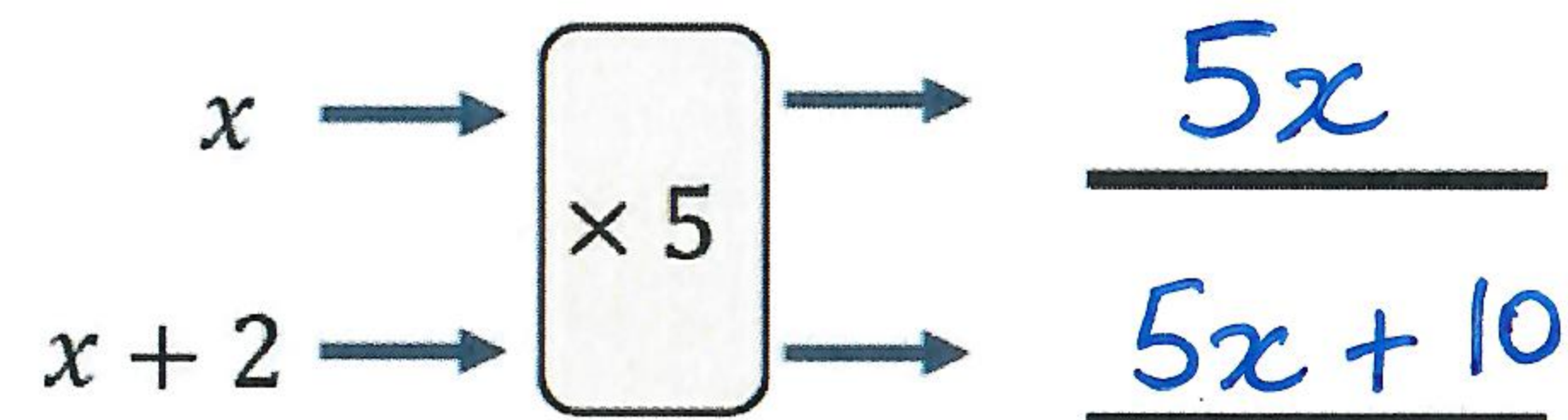
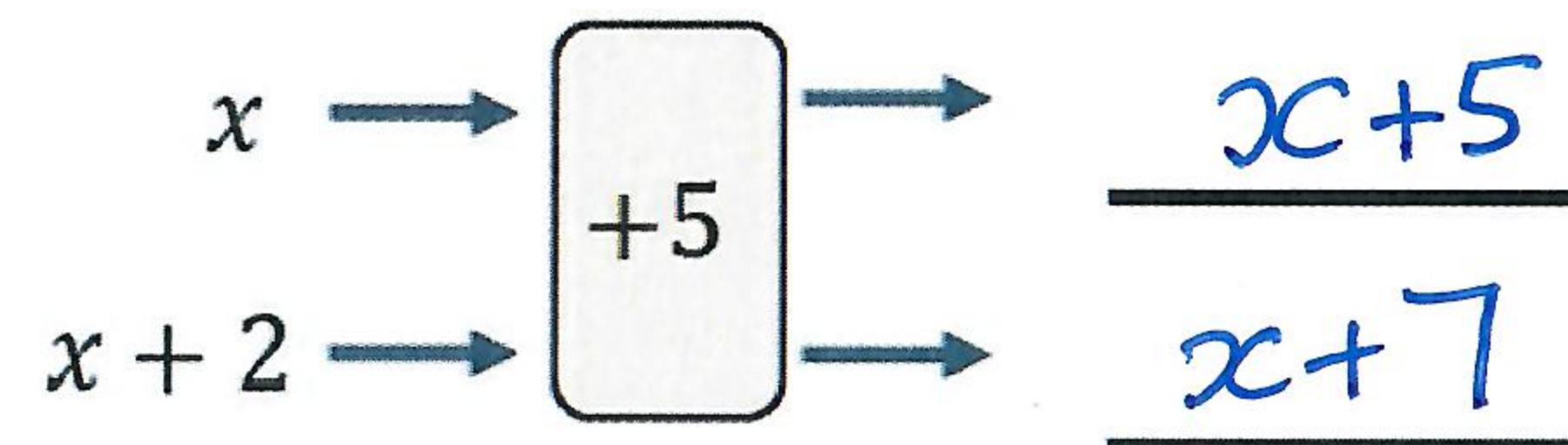
$7 \times d$ 7d

$e + 3e + 2e - 5e + 8e$ 9e

$8f \div 2$ 4f

1 mark

5 Write expressions to show each output.



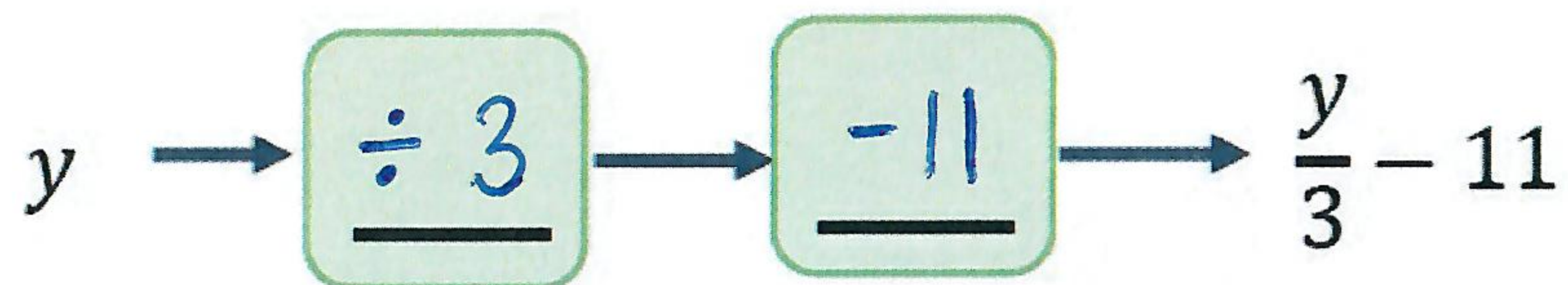
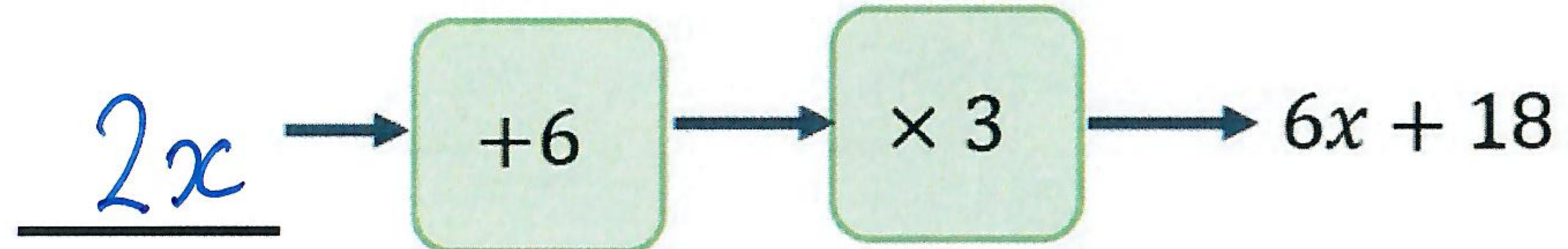
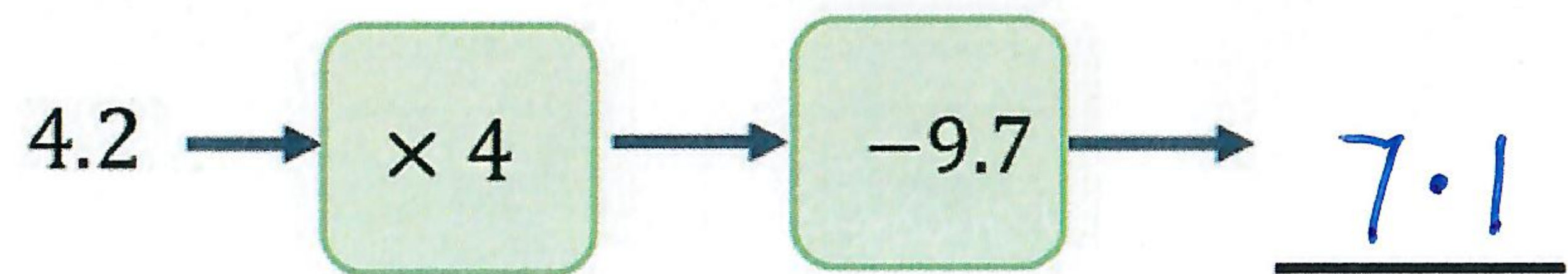
2 marks

6 Circle the expressions which equal zero when $a=20$.

$a - 20$ $20 - a$
 $\frac{20}{a}$ $\frac{a}{20}$

1 mark

7 Complete the missing values.



8 $x = 16$ and $y = 8$
 Work out the value of the expression $\frac{x+y}{3}$
 $\frac{16+8}{3} = \frac{24}{3} = 8$ 8

If the value of y increases, what will happen to the value of the expression?

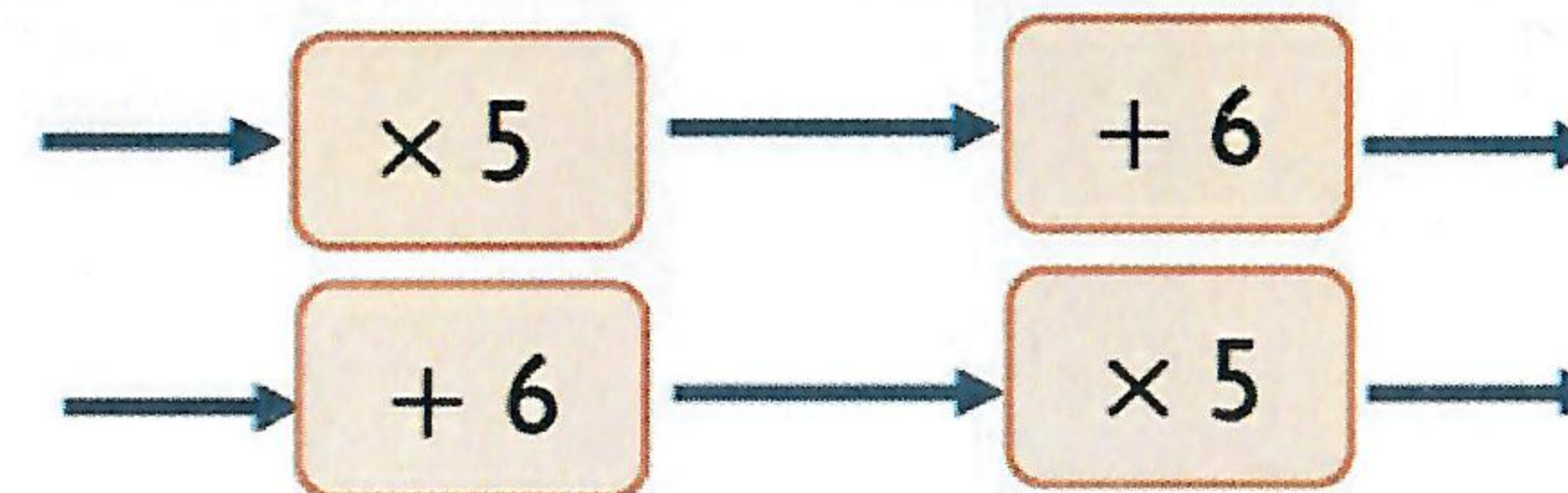
It goes up

9 Tick the equations that are straight line graphs.

$y = 9 - x^2$ $y = 13 + 9$

$y = 5^2 - \frac{x}{3}$ $y = 4x^2 + 3$

10 Mia says that given the same input, both function machines will always have the same output.

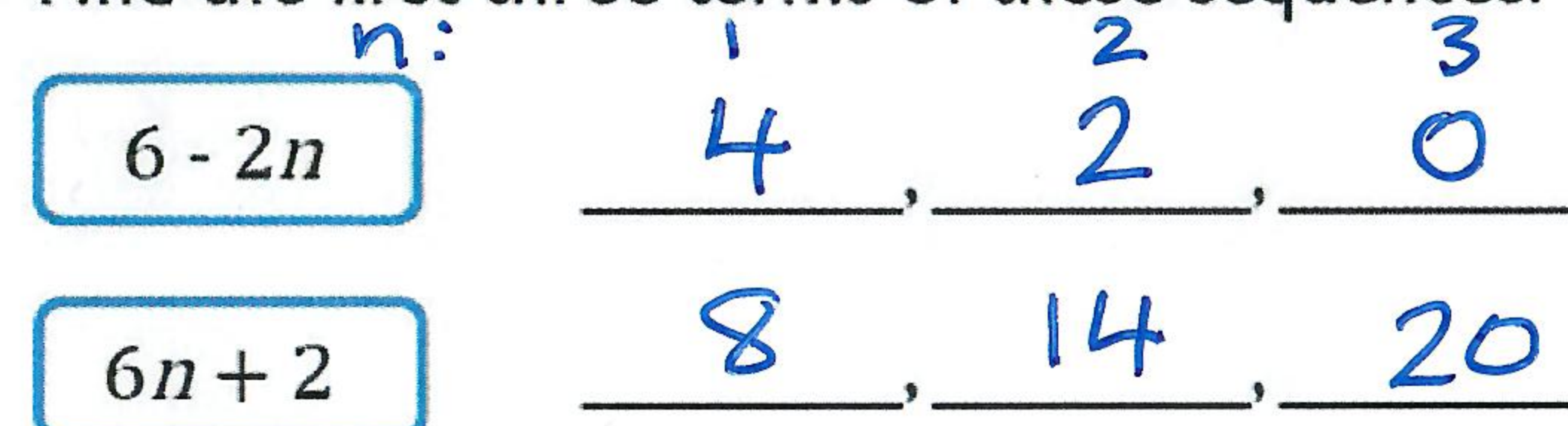


Give an example to show Mia is **wrong**.

There are an infinite number of correct answers

$9: (9 \times 5) + 6 = 51$
 $(9 + 6) \times 5 = 75$

11 Find the first three terms of these sequences.



Describe a difference between the two sequences.

$6 - 2n$ is decreasing by 2 each time.

$6n + 2$ is increasing by 6 each time.

Year 7 Assessment Algebraic Notation 3

Total Score /20



Name: Answers

- 1 Find the output in each of these function machines when the input is 105

$$105 \rightarrow \boxed{+700} \rightarrow \underline{805}$$

$$105 \rightarrow \boxed{-27.5} \rightarrow \underline{77.5}$$

- 2 Find the missing numbers for each of these function machines.

$$\underline{30} \rightarrow \boxed{\times 1.6} \rightarrow 48$$

$$\underline{0.3} \rightarrow \boxed{\times 16} \rightarrow 4.8$$

$$0.3 \rightarrow \boxed{\underline{\times 160}} \rightarrow 48$$

- 3 What is the **inverse** function of this machine?

$$\rightarrow \boxed{\times 67} \rightarrow \underline{\div 67}$$

2 marks

3 marks

1 mark

- 4 Simplify these expressions.

$$3 \times d \quad \underline{3d}$$

$$e + e + 2e - 7e + e \quad \underline{-2e}$$

$$15f \div 3 \quad \underline{5f}$$

1 mark

- 5 Write expressions to show each output.

$$\begin{array}{l} x \rightarrow \boxed{-7} \rightarrow \underline{x-7} \\ x+5 \rightarrow \boxed{-7} \rightarrow \underline{x-2} \end{array}$$

$$\begin{array}{l} x \rightarrow \boxed{\times 3} \rightarrow \underline{3x} \\ x+5 \rightarrow \boxed{\times 3} \rightarrow \underline{3x+15} \end{array}$$

- 6 Circle the expressions which equal two when $a=15$.

$a - 30$

$30 - a$

$\frac{30}{a}$

$\frac{a}{30}$

2 marks

1 mark

7

Complete the missing values.

$$6.4 \rightarrow \boxed{\times 4} \rightarrow \boxed{-9.7} \rightarrow \underline{15.9}$$

$$\underline{3x+2} \rightarrow \boxed{+8} \rightarrow \boxed{\times 4} \rightarrow 12x + 40$$

$$y \rightarrow \boxed{\underline{\div 5}} \rightarrow \boxed{\underline{-10}} \rightarrow \frac{y}{5} - 10$$

8

 $x = 16$ and $y = 8$ Work out the value of the expression $\frac{x-y}{3}$

$$\frac{16-8}{3} = \frac{8}{3} = 2\frac{2}{3}$$

 $2\frac{2}{3}$ If the value of y increases, what will happen to the value of the expression?

It goes down because you are taking more away.

9

Tick the equations that are straight line graphs.

$$y = 12 - x \quad \boxed{\checkmark} \quad y = 13 - 7 \quad \boxed{\checkmark}$$

$$y = 5^2 - \frac{x}{3} \quad \boxed{\checkmark} \quad y = 4x^2 + 3x \quad \boxed{\quad}$$

3 marks

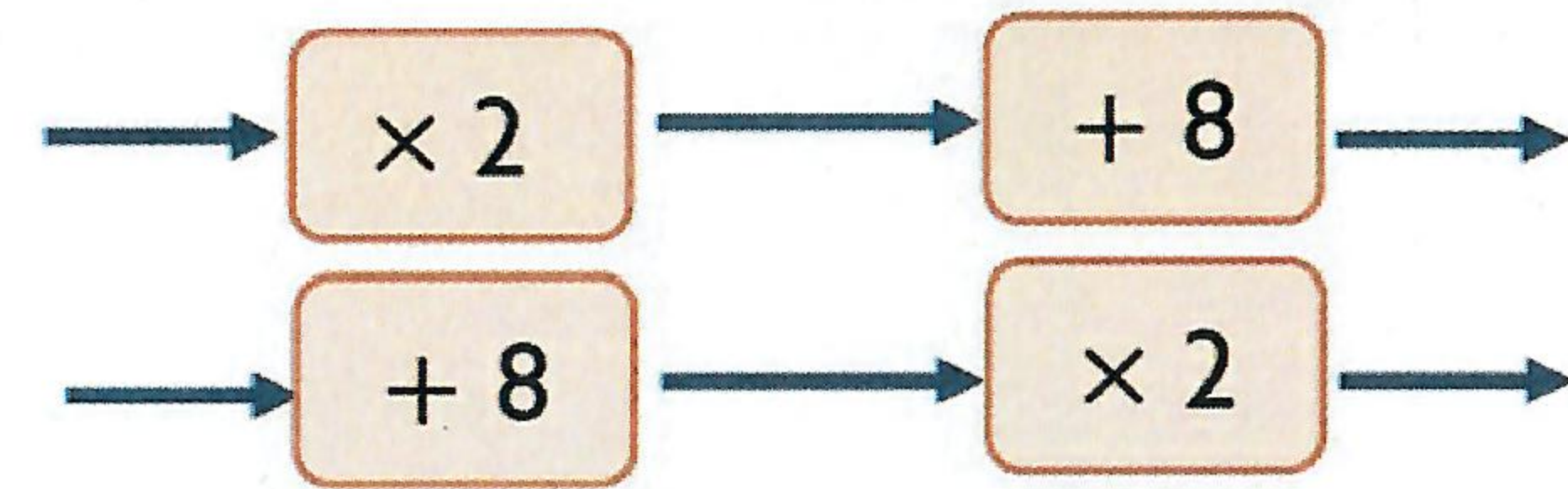
1 mark

1 mark

1 mark

10

Mia says that given the same input, both function machines will always have the same output.



Give an example to show Mia is wrong.

There are an infinite number of correct solutions.

$$12 : (12 \times 2) + 8 = 24 + 8 = 32$$

$$(12 + 8) \times 2 = 20 \times 2 = 40$$

11

Find the first three terms of these sequences.

$$\boxed{5 - 2n} \quad \begin{array}{ccc} 1 & 2 & 3 \\ \underline{3} & \underline{1} & \underline{-1} \end{array}$$

$$\boxed{5n + 2} \quad \underline{7}, \underline{12}, \underline{17}$$

Describe a difference between the two sequences.

 $5 - 2n$: The terms are decreasing by 2 each time.

 $5n + 2$: The terms are increasing by 5 each time.

1 mark

2 marks

1 mark