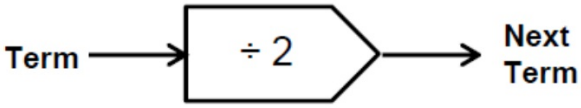
A7...Function Machines

OCR

(b) (i) The first term of a sequence is 12.

This is the rule for the sequence.

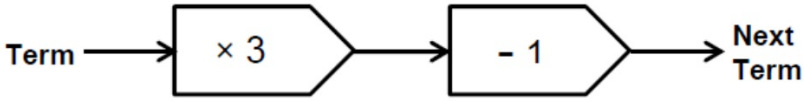


Write down the next two terms in the sequence.

(b)(i)…….. , ……..…**[1]**

(ii) The first term in a different sequence is 2.

This is the rule for this sequence.

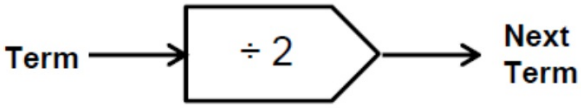


Write down the next two terms in this sequence.

(ii) …….. , ……..**[1]**

(b) (i) The first term of a sequence is 12.

This is the rule for the sequence.



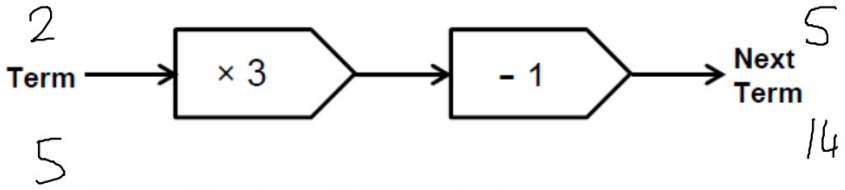
Write down the next two terms in the sequence.

12, 6, 3

(b)(i) 6 , 3 **[1]**

(ii) The first term in a different sequence is 2.

This is the rule for this sequence.

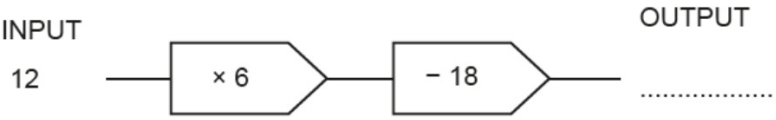


Write down the next two terms in this sequence.

(ii) 5 , 14 **[1]**

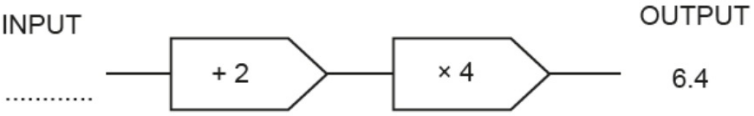
4 **(a)** Complete these number machines.

(i)



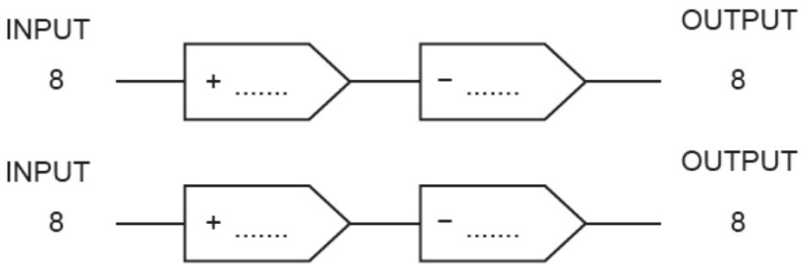
[1]

(ii)



[2]

(b) **(i)** Complete each number machine in a different way.



[3]

(ii) Explain why there are more ways to complete part **(b)(i)**.

.....

.....

.....

..... **[1]**

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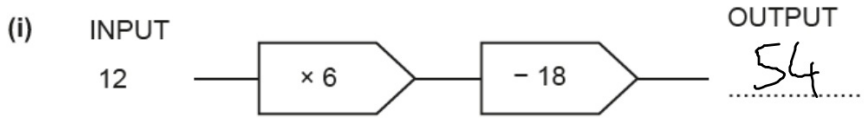
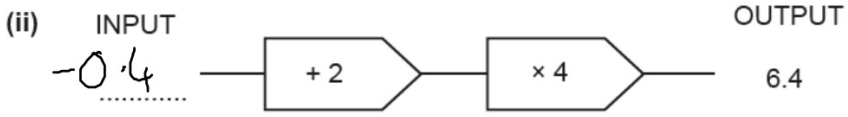
4 **(a)** Complete these number machines.

(i)



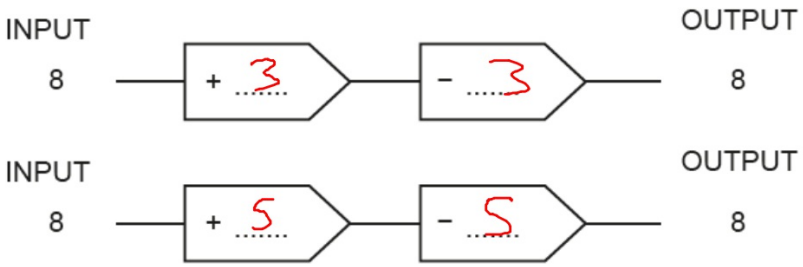
[1]

(ii)



[2]

(b) (i) Complete each number machine in a different way.



[3]

(ii) Explain why there are more ways to complete part **(b)(i)**.

choose any number as long as they are the same in each box.

[1]

8 This is a rule to find the time, in minutes, needed to roast lamb.

(a) Use the rule to work out the time needed to roast a piece of lamb which weighs 4 pounds.

(a) ..... minutes **[2]**

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8 This is a rule to find the time, in minutes, needed to roast lamb.

(b) A different piece of lamb takes 95 minutes to roast.

Use the rule to work out the weight of this piece of lamb.

(b) ..... pounds **[2]**

8 This is a rule to find the time, in minutes, needed to roast lamb.

(a) Use the rule to work out the time needed to roast a piece of lamb which weighs 4 pounds.

4 × 30 → +20 →

120

2hrs 20min

(a) 140 minutes **[2]**

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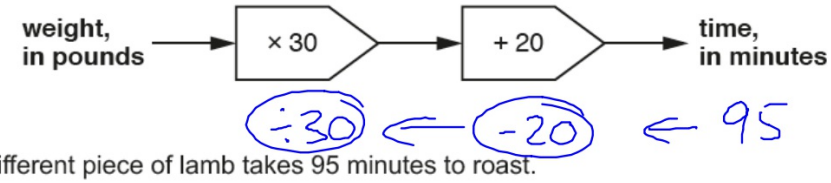
8 This is a rule to find the time, in minutes, needed to roast lamb.



÷30 ← -20 ← 95

(b) A different piece of lamb takes 95 minutes to roast.

Use the rule to work out the weight of this piece of lamb.

$\frac{75}{30} = 2\frac{15}{30}$

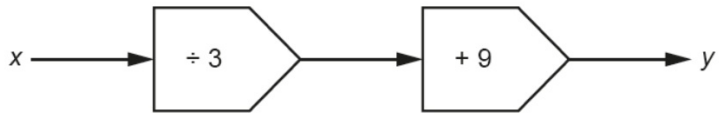
$2\frac{1}{2}$ or

(b) ..... 2.5 ..... pounds **[2]**

Video created by W Neill

8 Here is a function.
The input is x and the output is y.

A7



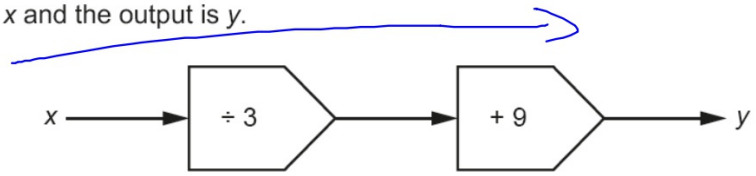
Write an algebraic expression for y in terms x.

$y =$ ..... **[2]**

Video created by W Neill

8 Here is a function.
The input is x and the output is y.

A7



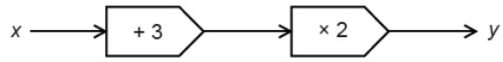
Write an algebraic expression for y in terms x.

$\frac{x}{3} + 9$ $\frac{x}{3} + 9$

$y =$ ..... **[2]**

Video created by W Neill

14 Here is a function.

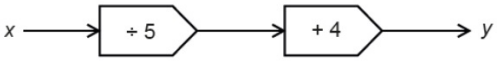
Function A: 

(a) Complete the table of values for **function A**.

x	y
-5	
	11

[2]

Here is another function.

Function B: 

(b) Find the inverse function of **function B**.

[2]

Video created by W Neill

Function A: x → + 3 → × 2 → y

Function B: x → ÷ 5 → + 4 → y

(c) Here is a composite function.

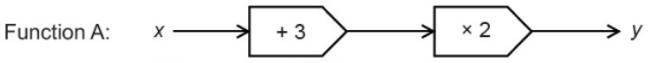
m → Function A → Function B → $2p + 4$

Find an expression for m in terms of p.
Give your answer in its simplest form.

(c) $m =$ ..... **[4]**

Video created by W Neill

14 Here is a function.



-5 -3 ÷2 ← 11

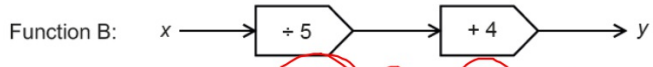
(a) Complete the table of values for **function A**.

A7

x	y
-5	-4
2·5	11

[2]

Here is another function.



×5 ← -4 ←

(b) Find the inverse function of **function B**.

A66 opposite

$y = 5(x - 4)$ ✓

[2]

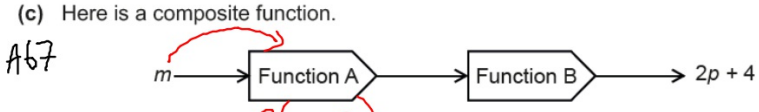
Video created by W Neill

Function A: x → +3 → ×2 → y $\quad 2(x+3)$

Function B: x → ÷5 → +4 → y $\quad \frac{x}{5}+4$

(c) Here is a composite function.

A67



$2(m+3)$

Find an expression for m in terms of p.
Give your answer in its simplest form.

$\frac{x}{5}+4$

$$\frac{2(m+3)}{5}+4=2p+4$$

$$\Rightarrow \frac{2m+6}{5}=2p$$

$$\Rightarrow 2m+6=10p$$

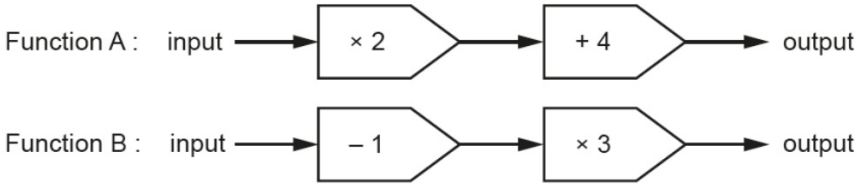
$$2m=10p-6$$

$$m=5p-3$$

(c) $m =$ $5p-3$ **[4]**

11 Here are two functions.

A7
A67



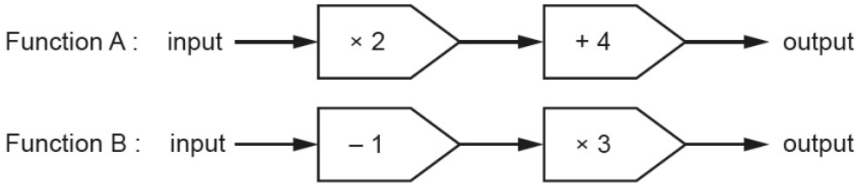
Composite function C is shown below.

(a) The output from function C is 54.

Work out the input.

(a) ..... **[2]**

11 Here are two functions.



Composite function C is shown below.

(b) The input to function C is x.

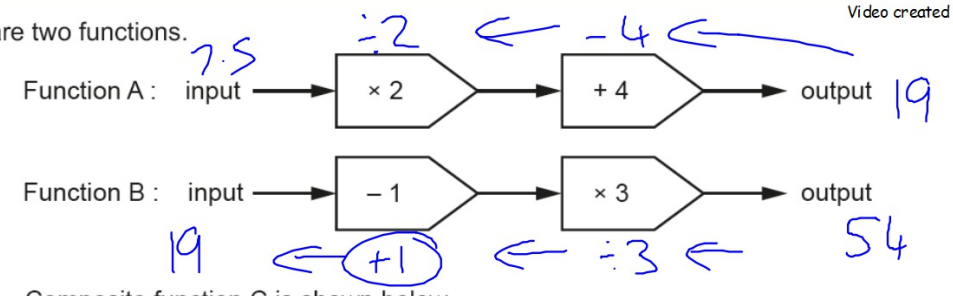
Find an expression, in terms of x, for the output from function C.

(b) ..... **[2]**

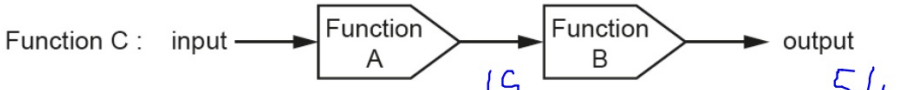
Video created by W Neill

11 Here are two functions.

A7
A67



Composite function C is shown below.



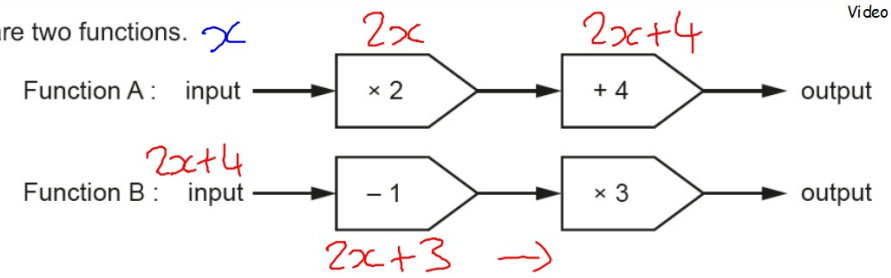
(a) The output from function C is 54.

Work out the input.

(a) 7.5 ..... **[2]**

Video created by W Neill

11 Here are two functions.



Composite function C is shown below.

(b) The input to function C is x.

Find an expression, in terms of x, for the output from function C.

(b) $3(2x+3)$ or $6x+9$ ✓ ..... **[2]**

Edexcel

12 A rule to change a UK shoe size to a European shoe size is

multiply the UK shoe size by 1.25 and then add 32

European shoe sizes are given as whole numbers.

Katie's UK shoe size is 5

(a) Work out Katie's European shoe size.

Gustav's European shoe size is 42

(b) Work out Gustav's UK shoe size.

.....

(2)

.....

(2)

(Total for Question 12 is 4 marks)

Created by W Neill

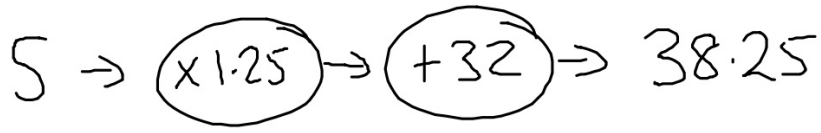
12 A rule to change a UK shoe size to a European shoe size is

multiply the UK shoe size by 1.25 and then add 32

European shoe sizes are given as whole numbers.

Katie's UK shoe size is 5

(a) Work out Katie's European shoe size.

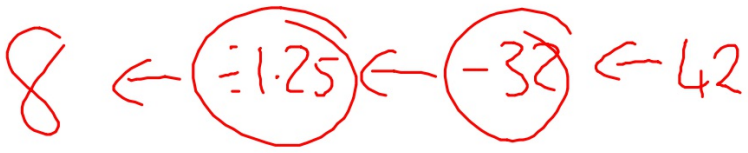


Gustav's European shoe size is 42

38 or 39 ✓

(2)

(b) Work out Gustav's UK shoe size.



8

(2)

(Total for Question 12 is 4 marks)

9 Here is a number machine.

(a) Find the output when the input is 6

.....

(1)

(b) Find the output when the input is −4

.....

(1)

(c) Find the input when the output is 79

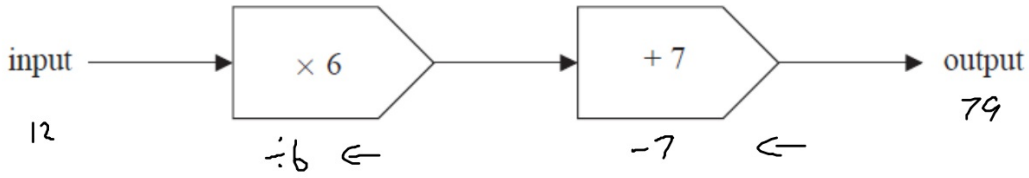
.....

(2)

(Total for Question 9 is 4 marks)

Created by W Neill

9 Here is a number machine.



(a) Find the output when the input is 6

43

(1)

(b) Find the output when the input is −4

-17

(1)

(c) Find the input when the output is 79

12

(2)

(Total for Question 9 is 4 marks)

Video Created by W Neill

10 Here is a number machine.

A7

(a) Work out the **output** when the input is 8

.....

(1)

(b) Work out the **input** when the output is 28

.....

(2)

Video Created by W Neill

10 Here is a number machine.

A7

(a) Work out the **output** when the input is 8

8 → ×5 → -2

40 38

38

(1)

(b) Work out the **input** when the output is 28

6 ← ÷5 ← +2 ← 28

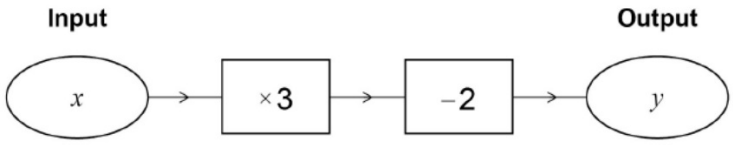
6

(2)

AQA

Video created by W Neill

7 Here is a number machine.



7 (a) Work out the output when the input is 4

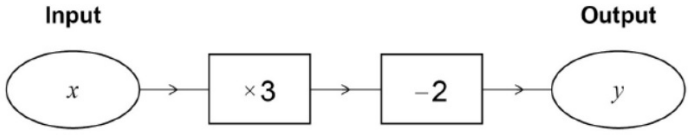
A7

[1 mark]

Answer _____

Video created by W Neill

Here is a number machine.



7 (b) Work out the output when the input is –4

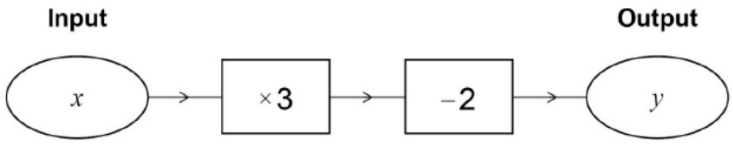
A7

[1 mark]

Answer _____

Video created by W Neill

7 Here is a number machine.



4 x3 -2

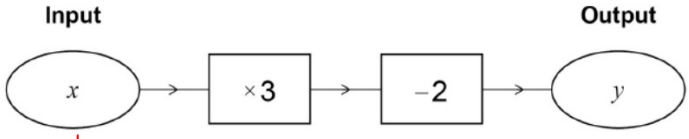
7 (a) Work out the output when the input is 4

A7 12 - 2 = 10 **[1 mark]**

Answer 10

Video created by W Neill

Here is a number machine.



−4

7 (b) Work out the output when the input is –4

A7

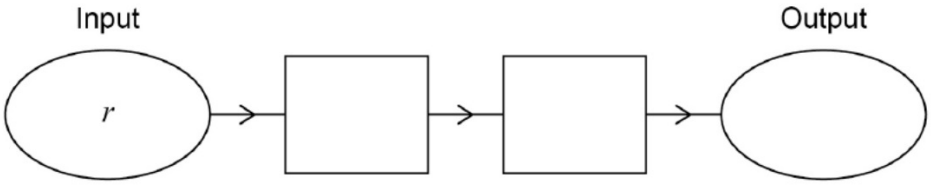
[1 mark]

Answer −14

Video created by W Neill

8 (a) Complete the number machine so that $q = 7r - 2$

A7

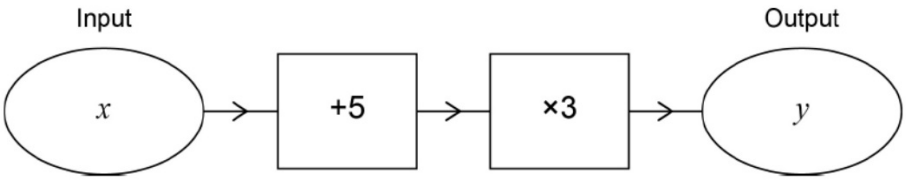


[2 marks]

Video created by W Neill

8 (b) Write down the output y in terms of x.

A7



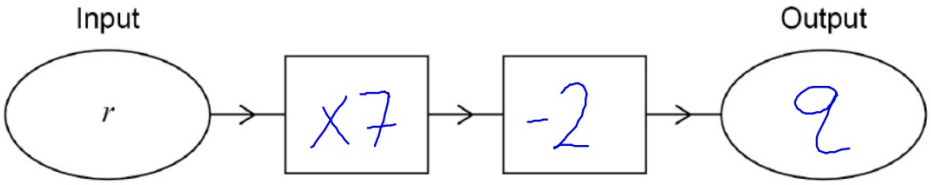
[1 mark]

Answer _____

Video created by W Neill

8 (a) Complete the number machine so that $q = 7r - 2$

A7



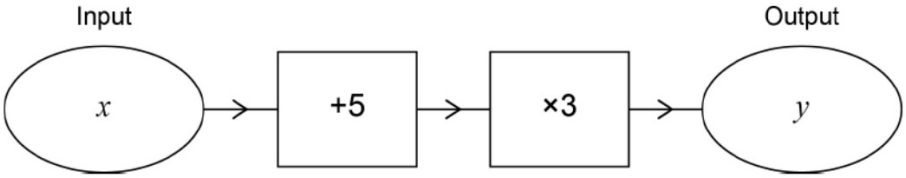
[2 marks]

Video created by W Neill

8 (b) Write down the output y in terms of x.

$(x+5)\times 3$ ✗

A7



$x + 5$ then $\times 3$

[1 mark]

Answer $y = 3(x+5)$ ✓