2.8 Function Machines: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A function machine multiplies the input by 6. The input is 7. Work out the output.

(Total for Question 1 is 1 mark)

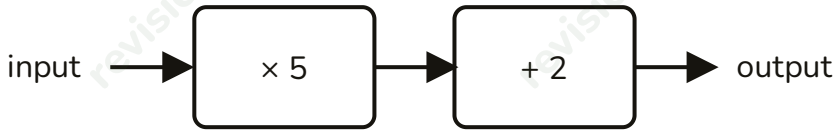
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2 A function machine subtracts 9 from the input. The input is 15. Work out the output.

(Total for Question 2 is 1 mark)

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3 A function machine has two steps: input --> [x 5] --> [+2] --> output.



(a) Write down the inverse function machine (reverse the order and use the inverse operations). **(2)**

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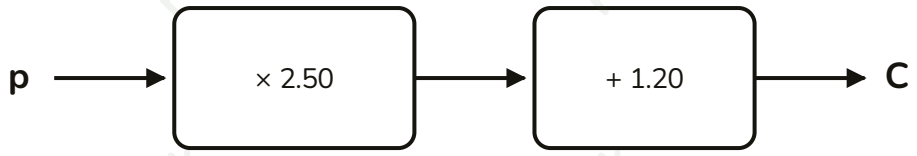
(b) Use your inverse function machine to find the input when the output is 27. **(2)**

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(Total for Question 3 is 4 marks)

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4 A coach company uses the function machine below to work out the total cost, C (in pounds), for a group booking with p passengers:
p --> [x 2.50] --> [+1.20] --> C



(a) Work out the total cost for a group of 6 passengers. **(2)**

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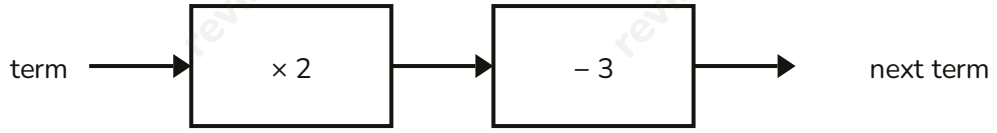
(b) Another group paid a total cost of £26.20. Work out how many passengers were in the group. **(3)**

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(Total for Question 4 is 5 marks)

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5 A sequence is generated using the function machine: term --> [x 2] --> [-3] --> next term. The first term is 5.



(a) Work out the second term. **(1)**

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(b) Work out the third term. **(2)**

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(Total for Question 5 is 3 marks)

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6 Here is a function machine.
input --> [+ 12] --> output
Work out the output when the input is each of 3, 12, 9.

(Total for Question 6 is 3 marks)

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7 Here is a function machine.
input --> [x 6] --> [+ 7] --> output
The input is n. (a) Write an expression for the output. (b) Work out the output when n = 6.

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(Total for Question 7 is 3 marks)

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8 Here is a function machine.

input --> [+ 2] --> [- 2] --> output

Work out the output when the input is 10, and when the input is 1.

(Total for Question 8 is 3 marks)

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9 A function machine multiplies the input by 7 then subtracts 2. Write an expression in terms of x for the output.

(Total for Question 9 is 1 mark)

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Mark scheme · 2.8 Function Machines: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

42 cao	**B1**

Answer: 42 (because 6 x 7 = 42).

Question 2

6 cao	**B1**

Answer: 6 (because 15 - 9 = 6).

Question 3

(a) correct inverse operations identified: -2 and /5	**M1**
(a) correct order stated: output --> [-2] --> [/5] --> input oe	**A1**

(a) Answer: output --> [-2] --> [/5] --> input

(b) 25 seen (27-2)	**M1**
(b) 5 cao	**A1**

(b) Answer: 5

Question 4

(a) 15.00 seen (6 x 2.50)	**M1**
(a) 16.20 cao (accept 16.2)	**A1**

(a) Answer: £16.20

(b) 25.00 seen (26.20-1.20)	**M1**
(b) complete method: 25.00 / 2.50	**M1**
(b) 10 cao	**A1**

(b) Answer: 10 passengers

Question 5

(a) 7 cao	**B1**

(a) Answer: 7

(b) correct method using the second term (ft): 7x2, then -3	**M1**
(b) 11 cao	**A1**

(b) Answer: 11

Question 6

one output correct	**B1**
two outputs correct	**B1**
all outputs correct	**B1**

Answer: 15, 24, 21

Question 7

attempts to build the expression	**M1**
6n + 7	**A1**
43 cao	**B1**

Answer: (a) 6n + 7, (b) 43

Question 8

applies the operations in the correct order	**M1**
10 cao	**A1**
1 cao	**B1**

Answer: 10 and 1

Question 9

7x - 2 cao	**B1**

Answer: 7x - 2.

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