Function Machines Exam Practice

Q1. Here is a number machine.

Input $\longrightarrow$ | $\times 7$ | $\longrightarrow$ | $- 5$ | $\longrightarrow$ Output

a) What is the output when the input is 12?

$$(12 \times 7) - 5$$

$$79$$

Answer: 79

(2 marks)

b) What is the input when the output is 37?

$$(37 + 5) \div 7$$

$$62 \div 7$$

$$6$$

Answer: 6

(2 marks)

Q2. Here is a number machine.

Input $\longrightarrow$ $\boxed{-11}$ $\longrightarrow$ $\boxed{\div\ 9}$ $\longrightarrow$ Output

a) What is the output when the input is 119?

$$(119 - 11) \div 9$$

$$108 \div 9$$

$$12$$

Answer:_____12_____

(2 marks)

b) What is the input when the output is 5?
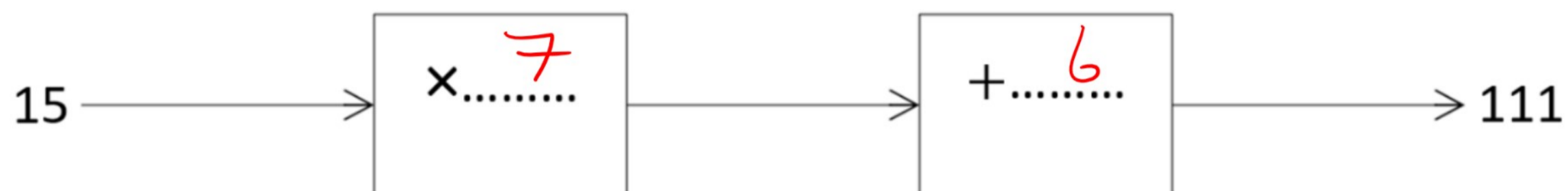
$$(5 \times 9) + 11$$

$$45 + 11$$

$$56$$

Answer:_____56_____

(2 marks)

Q3. Here is an incomplete number machine. Complete the number machine so that if the input is 15, the output is 111.
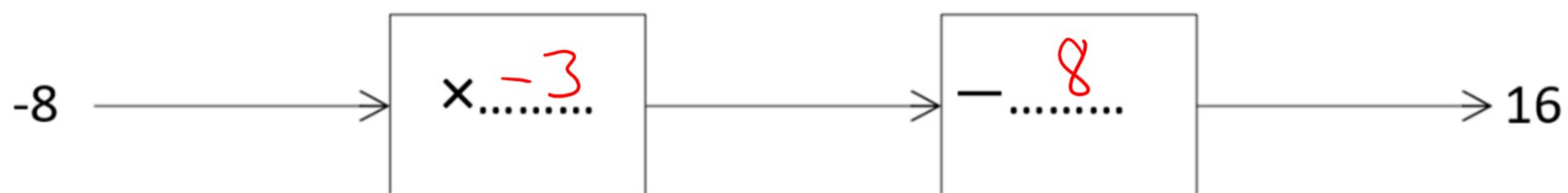
15 ⟶ [× .....7.....] ⟶ [+ .....6.....] ⟶ 111

(or any working combination.)

Answer:_____

(1 mark)

Q4. Here is an incomplete number machine. Complete the number machine so that if the input is -8, the output is 16.

-8 → [× -3] → [- 8] → 16

(or any working combination)

Answer:_____

(1 mark)

Q5. Here is a function machine:

Input $\longrightarrow$ $\boxed{\times 7}$ $\longrightarrow$ $\boxed{-72}$ $\longrightarrow$ Input

The input is the same as the output. Find the input.

$$7x - 72 = x$$

$$6x - 72 = 0$$

$$6x = 72$$

$$x = 12$$

Answer: 12

(2 marks)

Q6. Here is a function machine to convert between metres to inches:

metres → $\times 100$ → $\div 2.54$ → Inches

a) Norris is 1.76m tall. Use the machine to work out his height to the nearest inch.

$1.76 \times 100 \div 2.54$

$176 \div 2.54$

69.29

69 inches

Answer: 69 inches

(2 marks)

b) Casey is 5 feet 2½ inches tall. Use the machine to work out her height in metres to 2 decimal places.

[You are given that **1 foot = 12 inches**]

5ft 2½ inches $= 62.5$ inches

$(62.5 \times 2.54) \div 100$

1.5875 m

Answer: 1.59 m

(2 marks)

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Q7. Norman runs a taxi firm. He charges customers £2.50 for each mile they travel as well as a booking fee of £1.25

Miles → [× 2.5] → [+ 1.25] → Cost

a) Complete the number machine so it models Norman's charging scheme.

Answer:_____

(1 mark)

b) Bill lives in Bryston and wants to go to Ridgeway, which is 18 miles away. He thinks that he can hire a taxi for £45. Do you agree? You must show your working.

$(18 \times 2.5) + 1.25$
$= £46.25$
so no

Answer:___ho_____

(2 marks)

c) Norman decides that he wishes to increase his charge per mile, but keep the booking fee as it is. He would like a journey of 49 miles to cost £87. Work out what his new charge per mile should be.

$49 \times m + 1.25 = 87$
$49m = 85.75$
$m = 1.75$

Answer:___£1.75/mile_____

(2 marks)

Q8. In round 1 of a game, the number 4 is used to obtain an output number using the machine below. In round 2, this output number is used as the next input value to the machine, and so on.
Work out how many rounds of the game will be needed to obtain an output which is more than 100.

Input $\longrightarrow$ | × 3 | $\longrightarrow$ | −7 | $\longrightarrow$ Output

$$4 \times 3 - 7 = 5$$
$$5 \times 3 - 7 = 8$$
$$8 \times 3 - 7 = 17$$
$$17 \times 3 - 7 = 44$$
$$44 \times 3 - 7 = 125$$

6 rounds required

Answer: 6 rounds

(3 marks)