Year 3 maths: Number machines (Medium)

Maths · Patterns and algebra
Level: Medium

Student: _____ Date: _____

Instructions
- There are 10 questions. Read each one carefully.
- Write your answers on this paper. Use the space under a question to work it out.
- A grown-up can read a question aloud — that's fine.
- The answers are at the end. Check them together when you have finished.

Questions

1. START is 8. The machine does × 2, then + 7. What comes out?

Answer: ☐

Working:

2. Triple 7, then take away 5. What number do you get?

Circle one answer.

○ **A** 5 ○ **B** 26 ○ **C** 16 ○ **D** 21

3. Start with a dozen. Take away 4. What number do you have?

Answer: ☐

Working:

4. The machine's rule is × 4. 32 comes out. What number went in?

Answer: ☐

Working:

5. START → × 2 → − 1 → 15. What number went in at START? Answer: ☐

IN ? → ×2 → −1 → OUT 15

Working:

6. Noah thinks of a number. He adds 6 and then takes away 2. He gets 15. What number did he start with?

Circle one answer.

○ **A** 11 ○ **B** 17 ○ **C** 19 ○ **D** 7

7. Ruby thinks of a number. She adds 4 and then multiplies by 3. She gets 27. What number did she start with?

Circle one answer.

○ **A** 5 ○ **B** 9 ○ **C** 93 ○ **D** 6

8. Amira thinks of a number. She multiplies it by 3, then takes away 6. She gets 21. Run the machine backwards: what number did she think of? Answer: ☐

IN ? → ×3 → −6 → OUT 21

Working:

9. 5 × □ + 3 = 38. Run the machine backwards: what number goes in the box? Answer: ☐

IN ? → ×5 → +3 → OUT 38

Working:

10. What number must go in the box to make this number sentence true? □ × 3 − 9 = 18

Circle one answer.

○ **A** 3 ○ **B** 15 ○ **C** 27 ○ **D** 9

Answer key

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1. 23

8 × 2 = 16. 16 + 7 = 23.

2. C — 16

Triple 7 is 7 + 7 + 7 = 21. 21 − 5 = 16.

3. 8

A dozen is 12. 12 − 4 = 8.

4. 8

Undo × 4 by dividing by 4: 32 ÷ 4 = 8. Check: 8 × 4 = 32.

5. 8

Undo the last box first: 15 + 1 = 16. Then undo × 2: 16 ÷ 2 = 8. Check: 8 × 2 = 16, 16 − 1 = 15.

6. A — 11

Undo − 2: 15 + 2 = 17. Undo + 6: 17 − 6 = 11. Check: 11 + 6 = 17, 17 − 2 = 15.

7. A — 5

Undo × 3: 27 ÷ 3 = 9. Undo + 4: 9 − 4 = 5. Check: 5 + 4 = 9, 9 × 3 = 27.

8. 9

Undo − 6: 21 + 6 = 27. Undo × 3: 27 ÷ 3 = 9. Check: 9 × 3 = 27, 27 − 6 = 21.

9. 7

Undo + 3: 38 − 3 = 35. Undo × 5: 35 ÷ 5 = 7. Check: 5 × 7 + 3 = 38.

10. D — 9

Undo − 9: 18 + 9 = 27. Undo × 3: 27 ÷ 3 = 9. Check: 9 × 3 = 27, 27 − 9 = 18.