Checking solutions by substitution

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Check whether $x = 9$ solves $x + 8 = 17$. [2 marks]

Substitute 9: $9 + 8 = 17$.

Both sides are 17.

Answer: Yes.

2. Check whether $m = 4$ solves $5m = 25$. [2 marks]

$5 \times 4 = 20$.

$20 \neq 25$, so 4 does not work.

Answer: No.

3. Check whether $a = 6$ solves $3(a + 2) = 24$. [2 marks]

$3(6 + 2) = 3 \times 8 = 24$.

The brackets are calculated before multiplication.

Answer: Yes.

4. Check whether $n = 12$ solves $n \div 4 + 2 = 5$. [2 marks]

$12 \div 4 + 2 = 3 + 2 = 5$.

Both sides are 5.

Answer: Yes.

5. Which of 3, 4 and 5 solves $4t - 3 = 13$? Show the successful check. [3 marks]

For 3, $4 \times 3 - 3 = 9$.

For 4, $4 \times 4 - 3 = 13$.

For 5, $4 \times 5 - 3 = 17$.

Only 4 produces 13.

Answer: $t = 4$

6. A student says $b = 5$ solves $2(b + 4) = 14$ because $2 \times 5 + 4 = 14$. Explain the error and check $b = 3$. [3 marks]

With $b = 5$, the left side is $2(5 + 4) = 18$, not 14.

With $b = 3$, $2(3 + 4) = 2 \times 7 = 14$.

Answer: The brackets were ignored; $b = 3$ works.