Equality and balancing

6 questions | 11 marks

Equivalent correct methods earn the corresponding marks.

1. Complete $7 + 8 = 10 + \square$. [1 mark]

The left total is 15.

The missing value is $15 - 10 = 5$.

Answer: 5

2. Is $18 - 5 = 6 + 7$ true? Explain. [2 marks]

$18 - 5 = 13$ and $6 + 7 = 13$.

The expressions have equal values.

Answer: Yes; each side is 13.

3. Find x in $x + 3 = 11$ by keeping both sides balanced. [2 marks]

Subtract 3 from both sides.

$x = 11 - 3 = 8$.

Answer: $x = 8$

4. An equation is $m - 5 = 9$. Explain why adding 5 to both sides is useful. [2 marks]

Adding 5 undoes subtracting 5 on the left.

$m - 5 + 5 = 9 + 5$, so $m = 14$.

Answer: $m = 14$

5. A student changes $a + 7 = 19$ into $a = 19$. What change has been missed? [2 marks]

Removing 7 on the left must also remove 7 on the right.

The balanced result is $a = 19 - 7 = 12$.

Answer: Subtracting 7 from the right side.

6. The same number is added to both sides of a true equation. Must the new equation be true? Explain with an example. [2 marks]

Equal starting totals remain equal after the same addition.

For example, $6 = 6$ becomes $6 + 4 = 6 + 4$, and both sides are 10.

Answer: Yes.