Linear equations topic test

15 questions | 36 marks | 45 minutes

A by-hand review of balancing, checks, one- and two-step equations and familiar models.

Equivalent correct methods earn the corresponding marks.

1. What does the equals sign in an equation tell you? [1 mark]

An equation states equality of its left and right expressions.

Answer: The two sides have the same value.

2. Complete $8 + 7 = \square + 9$. [1 mark]

$8 + 7 = 15$, so the missing number is $15 - 9 = 6$.

Answer: 6

3. Solve $x + 4 = 11$. State the operation used on both sides. [2 marks]

Subtract 4 from both sides: $x = 11 - 4 = 7$.

Answer: $x = 7$

4. Check whether $x = 5$ solves $3x + 2 = 17$. [2 marks]

$3 \times 5 + 2 = 15 + 2 = 17$.

This matches the right side.

Answer: Yes.

5. Solve $a + 9 = 26$. [2 marks]

Subtract 9: $a = 26 - 9 = 17$.

Check: $17 + 9 = 26$.

Answer: $a = 17$

6. Solve $n - 8 = 13$. [2 marks]

Add 8: $n = 13 + 8 = 21$.

Check: $21 - 8 = 13$.

Answer: $n = 21$

7. Solve $6p = 42$. [2 marks]

Divide by 6: $p = 42 \div 6 = 7$.

Check: $6 \times 7 = 42$.

Answer: $p = 7$

8. Solve $\frac{b}{4} = 9$. [2 marks]

Multiply by 4: $b = 9 \times 4 = 36$.

Check: $36 \div 4 = 9$.

Answer: $b = 36$

9. Solve $3x + 5 = 26$ and check your answer. [3 marks]

Subtract 5: $3x = 21$.

Divide by 3: $x = 7$.

Check: $3 \times 7 + 5 = 26$.

Answer: $x = 7$

10. Solve $5m - 4 = 31$. [3 marks]

Add 4: $5m = 35$.

Divide by 5: $m = 7$.

Check: $5 \times 7 - 4 = 31$.

Answer: $m = 7$

11. Solve $\frac{n}{3} + 4 = 10$. [3 marks]

Subtract 4: $n \div 3 = 6$.

Multiply by 3: $n = 18$.

Check: $18 \div 3 + 4 = 10$.

Answer: $n = 18$

12. Solve $2(p+3)=22$. [3 marks]

Divide by 2: $p+3=11$.

Subtract 3: $p=8$.

Check: $2(8+3)=22$.

Answer: $p=8$

13. Leah has c cards. She receives 7 more and now has 24. Write an equation and find how many cards she started with. [3 marks]

The starting number plus 7 gives $c+7=24$.

Subtract 7: $c=17$.

Check: $17+7=24$.

Answer: $c+7=24$; 17 cards.

14. An activity centre charges 4 dollars for entry plus 3 dollars per ride. A visitor pays 25 dollars. Define a variable, form an equation and find the number of rides. [4 marks]

Let r be the number of rides.

Subtract 4: $3r=21$. Divide by 3: $r=7$.

Check: $3\times7+4=25$.

Answer: $3r+4=25$; 7 rides.

15. A student solves $4t+6=30$ by writing $4t=36$, then $t=9$. Explain the error and give the correct solution. [3 marks]

Undo adding 6 by subtracting 6 from both sides.

$4t=24$, so $t=6$.

Check: $4\times6+6=30$.

Answer: $t=6$; the student should subtract 6.