

What is a Linear Equation?

Worksheet

A linear equation in one variable has the form $ax + b = 0$, and its solution is $x = b/a$ (for $a \neq 0$). It represents a straight line when the equation involves two variables.

$$y = mx + b$$

Questions

1. Solve $5x - 15 = 0$.

- A) $x = 3$
- B) $x = -3$
- C) $x = 15$
- D) $x = -15$

2. What is the solution formula for $ax + b = 0$?

- A) $x = a/b$
- B) $x = b/a$
- C) $x = b/a$
- D) $x = ab$

3. A linear equation's graph is always a

- A) parabola
- B) circle
- C) straight line
- D) curve

4. Solve $x/4 + 2 = 0$.

- A) $x = 8$
- B) $x = -8$
- C) $x = 2$
- D) $x = -2$

5. Solve $2x - 6 = 0$.

6. Solve $3x + 9 = 0$.

7. Solve $4x + 20 = 0$.

8. Define: What is a linear equation?

9. Define: What is the solution formula for $ax + b = 0$?

10. Define: What happens if $a = 0$ in $ax + b = 0$?

Answer Key

1. A) $x = 3 - 5x = 15 \Rightarrow x = 15/5 = 3$.
2. B) $x = b/a$ - Isolating x gives $x = b/a$.
3. C) straight line - Linear equations have degree 1, which graphs as a straight line.
4. B) $x = 8 - x/4 = 2 \Rightarrow x = 8$.
5. Add 6 to both sides: $2x = 6$ Divide both sides by 2: $x = 3$
6. Subtract 9 from both sides: $3x = 9$ Divide both sides by 3: $x = 3$
7. Subtract 20 from both sides: $4x = 20$ Divide both sides by 4: $x = 5$
8. An equation where the variable's highest power is 1, e.g. $ax + b = 0$, which graphs as a straight line.
9. $x = b/a$, valid whenever $a \neq 0$.
10. There's no valid division - the equation either has no solution ($b \neq 0$) or infinite solutions ($b = 0$).

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