Algebra: Applying the Zero Product Property

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DIRECTIONS

Solve each equation using the Zero Product Property: if $a \cdot b = 0$, then $a = 0$ or $b = 0$. If the equation is not yet factored, factor it first, then set each factor equal to zero.

1. Solve:

$$(x - 3)(x + 5) = 0$$

Answer: _____

2. Solve:

$$x(x - 7) = 0$$

Answer: _____

3. Solve:

$$(2x - 1)(x + 4) = 0$$

Answer: _____

4. Solve:

$$(3x + 6)(x - 2) = 0$$

Answer: _____

5. Solve:

$$x^2 - 9 = 0$$

Answer: _____

6. Solve:

$$x^2 - 5x = 0$$

Answer: _____

7. Solve:

$$x^2 + 7x + 10 = 0$$

Answer: _____

8. Solve:

$$x^2 - x - 12 = 0$$

Answer: _____

9. Solve:

$$2x^2 + 5x - 3 = 0$$

Answer: _____

10. Solve:

$$x^2 + 6x + 9 = 0$$

Answer: _____

Based on the Numberbender lesson "Applying the Zero Product Property (ZPP)" • youtu.be/BuOrHLgdKas

Answer Key & Solutions

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TEACHER NOTES

Items 1–4: already factored — set each factor to zero. Items 5–6: factor out a common factor or use difference of squares. Items 7–9: factor a trinomial first. Item 10: perfect-square trinomial — double root.

1. Solve: (x – 3)(x + 5) = 0

Answer: x = 3, –5

x – 3 = 0 → x = 3; x + 5 = 0 → x = –5.

2. Solve: x(x – 7) = 0

Answer: x = 0, 7

x = 0 or x – 7 = 0 → x = 7.

3. Solve: (2x – 1)(x + 4) = 0

Answer: x = 1/2, –4

2x – 1 = 0 → x = 1/2; x + 4 = 0 → x = –4.

4. Solve: (3x + 6)(x – 2) = 0

Answer: x = –2, 2

3x + 6 = 0 → x = –2; x – 2 = 0 → x = 2.

5. Solve: $x^2 - 9 = 0$

Answer: x = ±3

Difference of squares: (x – 3)(x + 3) = 0 → x = ±3.

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

Answer: x = 0, 5

Factor x: x(x – 5) = 0 → x = 0 or x = 5.

7. Solve: $x^2 + 7x + 10 = 0$

Answer: x = –2, –5

(x + 2)(x + 5) = 0 → x = –2 or x = –5.

8. Solve: $x^2 - x - 12 = 0$

Answer: x = 4, –3

(x – 4)(x + 3) = 0 → x = 4 or x = –3.

9. Solve: $2x^2 + 5x - 3 = 0$

Answer: x = 1/2, –3

(2x – 1)(x + 3) = 0 → x = 1/2 or x = –3.

10. Solve: $x^2 + 6x + 9 = 0$

Answer: x = –3 (double root)

$(x + 3)^2 = 0$ → x = –3.