Algebra: Solving Radical Equations

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Name: _____ Date: _____ Score: ____ / 10

DIRECTIONS

Isolate the radical, then square both sides to eliminate it. Solve for the variable and always check for extraneous solutions.

1. Solve:

$\sqrt{x} = 5$

Answer: _____

2. Solve:

$\sqrt{x} = 9$

Answer: _____

3. Solve:

$\sqrt{(x + 3)} = 4$

Answer: _____

4. Solve:

$\sqrt{(2x)} = 6$

Answer: _____

5. Solve:

$\sqrt{(x - 1)} = 3$

Answer: _____

6. Solve:

$\sqrt{(3x + 4)} = 5$

Answer: _____

7. Solve:

$2\sqrt{x} = 8$

Answer: _____

8. Solve and check:

$\sqrt{(x + 5)} = x - 1$

Answer: _____

9. Solve and check:

$\sqrt{(2x - 3)} = x - 3$

Answer: _____

10. Solve:

$\sqrt{(5x - 4)} - 3 = 0$

Answer: _____

Based on the Numberbender lesson "How to Find the Solutions of Radical Equations" • youtu.be/lgd7DJ4E5rI

Answer Key & Solutions

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TEACHER NOTES

Items 1–4: isolate the radical then square — straightforward. Items 5–7: require an algebraic step before squaring. Items 8–9: quadratic results after squaring — check both roots for extraneous solutions. Item 10: two-step isolation.

1. Solve: $\sqrt{x} = 5$

Answer: x = 25

Square both sides: $x = 5^2 = 25$.

2. Solve: $\sqrt{x} = 9$

Answer: x = 81

Square both sides: $x = 9^2 = 81$.

3. Solve: $\sqrt{(x + 3)} = 4$

Answer: x = 13

Square: $x+3 = 16$; $x = 13$.

4. Solve: $\sqrt{(2x)} = 6$

Answer: x = 18

Square: $2x = 36$; $x = 18$.

5. Solve: $\sqrt{(x - 1)} = 3$

Answer: x = 10

Square: $x-1 = 9$; $x = 10$.

6. Solve: $\sqrt{(3x + 4)} = 5$

Answer: x = 7

Square: $3x+4 = 25$; $3x = 21$; $x = 7$.

7. Solve: $2\sqrt{x} = 8$

Answer: x = 16

Divide by 2: $\sqrt{x} = 4$; square: $x = 16$.

8. Solve and check: $\sqrt{(x + 5)} = x - 1$

Answer: x = 4

Square: $x+5=(x-1)^2$; $x^2-3x-4=0$; $x=4$ ✓ ($x=-1$ extraneous).

9. Solve and check: $\sqrt{(2x - 3)} = x - 3$

Answer: x = 6

Square: $2x-3=(x-3)^2$; $x^2-8x+12=0$; $x=6$ ✓ ($x=2$ extraneous).

10. Solve: $\sqrt{(5x - 4)} - 3 = 0$

Answer: x = 13/5

Add 3: $\sqrt{(5x-4)}=3$; square: $5x-4=9$; $5x=13$; $x=13/5$.