

Notes - on Solving

Informal Algebra 2 Solving Using Square Roots

Name key

Simplify.

1. $\sqrt{18}$

2. $\sqrt{72}$

3. $2\sqrt{7} \cdot \sqrt{7}$

4. $\sqrt{12} \cdot \sqrt{2}$

5. $\sqrt{175}$

6. $\sqrt{\frac{1}{9}}$

7. $\sqrt{\frac{3}{16}}$

8. $\frac{2}{\sqrt{3}}$

9. $\sqrt{\frac{7}{8}}$

10. $\sqrt{\frac{4}{49}}$

Solve

11. $\sqrt{x^2 + 90}$

$x = \pm 3\sqrt{10}$

12. $\frac{3x^2}{3} = \frac{108}{3}$

$\sqrt{x^2} = \sqrt{36}$

$x = \pm 6$

13. $\frac{2x^2}{2} + \frac{5}{2} = \frac{41}{2}$

$\frac{2x^2}{2} = \frac{36}{2}$

$\sqrt{x^2} = \sqrt{18}$
 $x = \pm 3\sqrt{2}$

14. $-x^2 - 12 = -87$

$-x^2 = -75$

$\sqrt{x^2} = \sqrt{75}$

$x = \pm 5\sqrt{3}$

15. $7 - 10x^2 = 1$

$-10x^2 = -6$

$\frac{-10x^2}{-10} = \frac{-6}{-10}$

$\sqrt{x^2} = \sqrt{\frac{3}{5}}$

$x^2 = \pm \frac{\sqrt{3}}{\sqrt{5}}, \frac{\sqrt{5}}{\sqrt{3}}$
 $x = \pm \frac{\sqrt{15}}{5}$

16. $\frac{2(x-3)^2}{2} = \frac{8}{2}$

$\sqrt{(x-3)^2} = \sqrt{4}$

$x-3 = \pm 2$
 $+3 \quad +3$
 $x = 5$
 $x = 1$

17. $\frac{4(x+1)^2}{4} = \frac{100}{4}$

$\sqrt{(x+1)^2} = \sqrt{25}$

$x+1 = \pm 5$

$x = 4$ $x = -6$

18. $\frac{-3(x+2)^2}{-3} = \frac{-18}{-3}$

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

$x+2 = \pm \sqrt{6}$

$x = -2 \pm \sqrt{6}$

19. $\frac{5(x-7)^2}{5} = \frac{135}{5}$

$\sqrt{(x-7)^2} = \sqrt{27}$

$x-7 = \pm 3\sqrt{3}$

$x = 7 \pm 3\sqrt{3}$

20. $\frac{8(x+4)^2}{8} = \frac{9}{8}$

$\sqrt{(x+4)^2} = \sqrt{\frac{9}{8}}$

$x+4 = \frac{3}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \pm \frac{3\sqrt{2}}{4}$

$x = -4 \pm \frac{3\sqrt{2}}{4}$

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AC Math 1
Solving Quadratic Equations
By Factoring & Using Square Roots

Name key

Solve each equation or find the zeros of the function by factoring or using square roots.

1. $6x^2 = 14x$
 $-14x -14x$

$6x^2 - 14x = 0$
 $2x(3x - 7) = 0$

$2x = 0$ $3x - 7 = 0$
 $x = 0$ $x = \frac{7}{3}$

4. $x^2 + 8x + 15 = 0$
 $(x + 5)(x + 3) = 0$
 $x + 5 = 0$ $x + 3 = 0$

$x = -5$ $x = -3$

7. $2x^2 = 5x + 3$

$2x^2 - 5x - 3 = 0$
 $(2x + 1)(x - 3) = 0$

$2x + 1 = 0$ $x - 3 = 0$

$x = -\frac{1}{2}$ $x = 3$

10. $f(x) = \frac{2}{3}x^2 - 12$

$\left(\frac{2}{3}\right)\frac{2}{3}x^2 = 12\left(\frac{3}{2}\right)$

$x^2 = \frac{36}{2}$

$\sqrt{x^2} = \sqrt{18}$ $x = \pm 3\sqrt{2}$

13. $f(x) = 4x^2 - 1$

2. $x^2 - 16 = 0$
 $+16 +16$

$\sqrt{x^2} = \sqrt{16}$
 $x = \pm 4$

5. $4(x - 1)^2 - 100 = 0$

$4(x - 1)^2 = 100$
 $\frac{4}{4}$ $\frac{100}{4}$

$\sqrt{(x - 1)^2} = \sqrt{25} \rightarrow x = 1 \pm 5$
 $x - 1 = \pm 5$ $x = 6, -4$

8. $(x + 6)^2 - 40 = 0$

$\sqrt{(x + 6)^2} = \sqrt{40}$
 $x + 6 = \pm 2\sqrt{10}$
 -6 -6

$x = -6 \pm 2\sqrt{10}$

11. $f(x) = 16x - 24$

$16x - 24 = 0$

$8(2x - 3) = 0$

$2x - 3 = 0$

$x = \frac{3}{2}$

14. $f(x) = 16x^2 - 9$

3. $2(x + 4)^2 - 10 = 0$
 $+10 +10$

$2(x + 4)^2 = 10$
 $\frac{2}{2}$ $\frac{10}{2}$
 $\sqrt{(x + 4)^2} = \sqrt{5}$

$x + 4 = \pm\sqrt{5}$
 -4 -4

$x = -4 \pm \sqrt{5}$

6. $9x(x - 7) - 4(x - 7) = 0$

$(9x - 4)(x - 7) = 0$

$(9x - 4) = 0$ $x - 7 = 0$

$x = \frac{4}{9}$ $x = 7$

9. $\frac{1}{4}(x + 3)^2 - 1 = 0$

$4 \cdot \frac{1}{4}(x + 3)^2 = 1 \cdot 4$

$\sqrt{(x + 3)^2} = \sqrt{4}$

$x + 3 = \pm 2$

$x = -3 \pm 2$
 $x = -5$
 $x = -1$

12. $f(x) = 10x^2 + 25x - 60$

$0 = 5(2x^2 + 5x - 12)$

$x^2 + 5x - 24$

$(x + 8)(x - 3)$

$0 = 5(x + 4)(2x - 3)$

$x + 4 = 0$ $2x - 3 = 0$

$x = -4$ $x = \frac{3}{2}$

15. $f(x) = 5x(2x - 1) + 3(2x - 1)$

16. $f(x) = 21x - 3x^2$

17. $f(x) = 4\left(x - \frac{7}{2}\right)^2 - 1$

18. $f(x) = 5x^2 - 14x + 8$