

Solving Quadratic Equations: Square Root Law

Solve each equation by taking square roots.

1) $r^2 = 96$
 $r = \pm\sqrt{96}$
 $r = \pm 4\sqrt{6}$ or $-4\sqrt{6}$
 irrational

2) $x^2 = 7$



3) $x^2 = 29$
 $x = \pm\sqrt{29}$
 irrational

4) $r^2 = 78$

5) $b^2 = 34$
 $b = \pm\sqrt{34}$
 irrational

6) $x^2 = 0$

7) $a^2 + 1 = 2$
 $a^2 = 1$
 $a = \pm 1$
 rational

8) $n^2 - 4 = 77$

9) $m^2 + 7 = 6$
 $m^2 = -1$
 $m = i$ or $-i$
 imaginary

10) $x^2 - 1 = 80$

11) $4x^2 - 6 = 74$
 $4x^2 = 80$
 $x^2 = 20$
 $x = \pm 2\sqrt{5}$ or $-2\sqrt{5}$
 irrational

12) $3m^2 + 7 = 301$

13) $7x^2 - 6 = 57$
 $7x^2 = 63$
 $x^2 = 9$
 $x = 3$ or -3
 rational

14) $10x^2 + 9 = 499$

15) $(p-4)^2 = 16$
 $p-4 = \pm 4$
 $p = 0$ or 8
 rational

16) $(2k-1)^2 = 9$
 $2k-1 = \pm 3$
 $k = \frac{1 \pm 3}{2}$
 $k = 2, -1$
 rational

17) $(6x+2)^2 + 4 = 28$
 $(6x+2)^2 = 24$
 $6x+2 = \pm 2\sqrt{6}$
 $x = \frac{-2 \pm 2\sqrt{6}}{6}$
 $x = \frac{-1 \pm \sqrt{6}}{3}$
 ≈ 0.483
 ≈ -1.15

18) $10(x-7)^2 = 440$

19) $9(2m-3)^2 + 8 = 449$
 $9(2m-3)^2 = 441$
 $(2m-3)^2 = 49$
 $2m-3 = \pm 7$
 $2m = 3 \pm 7$
 $m = \frac{3+7}{2}$ or $\frac{3-7}{2}$
 $m = 5$ or -2

20) $4(6x-1)^2 - 5 = 223$

Answers to Solving Quadratic Equations: Square Root Law

- 1) $\{4\sqrt{6}, -4\sqrt{6}\}$ 2) $\{\sqrt{7}, -\sqrt{7}\}$ 3) $\{\sqrt{29}, -\sqrt{29}\}$ 4) $\{\sqrt{78}, -\sqrt{78}\}$
5) $\{\sqrt{34}, -\sqrt{34}\}$ 6) $\{0\}$ 7) $\{1, -1\}$ 8) $\{9, -9\}$
9) No solution. 10) $\{9, -9\}$ 11) $\{2\sqrt{5}, -2\sqrt{5}\}$ 12) $\{7\sqrt{2}, -7\sqrt{2}\}$
13) $\{3, -3\}$ 14) $\{7, -7\}$ 15) $\{0, 8\}$ 16) $\{2, -1\}$
17) $\left\{\frac{-1+\sqrt{6}}{3}, \frac{-1-\sqrt{6}}{3}\right\}$ 18) $\{7+2\sqrt{11}, 7-2\sqrt{11}\}$ 19) $\{5, -2\}$
20) $\left\{\frac{1+\sqrt{57}}{6}, \frac{1-\sqrt{57}}{6}\right\}$