Solving for x by Taking Square Roots

Solve by using properties and taking the square root of both sides. Round all answers to the hundredths place.

1. $a^2 = 20$

$\sqrt{a^2} = \sqrt{20}$

$a = \pm 4.47$

$a = 4.47$

$a = -4.47$

2. $7x^2 = 84$

$\frac{7}{7} \quad \frac{84}{7}$

$x^2 = 12$

$\sqrt{x^2} = \sqrt{12}$

$x = \pm 3.46$

$x = 3.46$

$x = -3.46$

3. $x^2 - 16 = 8$

$+16 \quad +16$

$x^2 = 24$

$\sqrt{x^2} = \sqrt{24}$

$x = \pm 4.90$

$x = 4.90$

$x = -4.90$

4. $7y^2 + 18 = 4$

$-18 \quad -18$

$\frac{7y^2}{7} = \frac{-14}{7}$

$y^2 = -2$

No Solution

5. $4x^2 - 200 = -20$

$+200 \quad +200$

$\frac{4x^2}{4} = \frac{180}{4}$

$x^2 = 45$

$\sqrt{x^2} = \sqrt{45}$

$x = \pm 6.71$

$x = 6.71$

$x = -6.71$

6. $(x - 4)^2 = 25$

$\sqrt{(x-4)^2} = \sqrt{25}$

$x - 4 = \pm 5$

$x - 4 = 5 \quad +4 \quad +4$

$x = 9$

$x - 4 = -5 \quad +4 \quad +4$

$x = -1$

$x = 9$

$x = -1$

7. $(4t + 1)^2 = 49$

$\sqrt{(4t+1)^2} = \sqrt{49}$

$4t+1 = \pm 7$

$4t+1=7$ $\quad -1 \quad -1$

$\frac{4t}{4} = \frac{6}{4}$

$t = 1.5$

$4t+1=-7$ $\quad -1 \quad -1$

$\frac{4t}{4} = \frac{-8}{4}$

$t = -2$

8. $(2x - 3)^2 = 81$

$\sqrt{(2x-3)^2} = \sqrt{81}$

$2x-3 = \pm 9$

$2x-3=9$ $\quad +3 \quad +3$

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$

$2x-3=-9$ $\quad +3 \quad +3$

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

$x = -3$

9. $\frac{5(n + 1)^2}{5} = \frac{40}{5}$

$(n+1)^2 = 8$

$\sqrt{(n+1)^2} = \sqrt{8}$

$n+1 = \pm 2.83$

$n+1=2.83$ $\quad -1 \quad -1$

$n = 1.83$

$n+1=-2.83$ $\quad -1 \quad -1$

$n = -3.83$

10. $\frac{3(x - 2)^2}{3} = \frac{36}{3}$

$(x-2)^2 = 12$

$\sqrt{(x-2)^2} = \sqrt{12}$

$x-2 = \pm 3.46$

$x-2=3.46$ $\quad +2 \quad +2$

$x = 5.46$

$x-2=-3.46$ $\quad +2 \quad +2$

$x = -1.46$

11. $x^2 - 18x + 81 = 24$

$(x-9)^2 = 24$

$\sqrt{(x-9)^2} = \sqrt{24}$

$x-9 = \pm 4.90$

$x-9=4.90$ $\quad +9 \quad +9$

$x = 13.90$

$x-9=-4.90$ $\quad +9 \quad +9$

$x = 4.1$

12. $x^2 + 12x + 36 = 75$

$(x+6)^2 = 75$

$\sqrt{(x+6)^2} = \sqrt{75}$

$x+6 = \pm 8.66$

$x+6=8.66$ $\quad -6 \quad -6$

$x = 2.66$

$x+6=-8.66$ $\quad -6 \quad -6$

$x = -14.66$

13. $x^2 - 10x + 25 = 9$

$(x-5)^2 = 9$

$\sqrt{(x-5)^2} = \sqrt{9}$

$x-5 = \pm 3$

$x-5=3$ $\quad +5 \quad +5$

$x = 8$

$x-5=-3$ $\quad +5 \quad +5$

$x = 2$

14. $x^2 + 2x + 1 = 64$

$(x+1)^2 = 64$

$\sqrt{(x+1)^2} = \sqrt{64}$

$x+1 = \pm 8$

$x+1=8$ $\quad -1 \quad -1$

$x = 7$

$x+1=-8$ $\quad -1 \quad -1$

$x = -9$