

Day 5 - Solving by Square Roots (COMPLEX)

Name: Key

Practice Assignment

Directions: Solve each equation. Put your answers in decimal form AND simplest radical form (if necessary).

1. $\sqrt{x-3} = \sqrt{4}$

$$x-3 = \pm 2$$

$$\begin{array}{r} x-3=2 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\boxed{x=5}$$

$$\begin{array}{r} x-3=-2 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\boxed{x=1}$$

2. $\sqrt{x-4} = \frac{125}{5}$

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

$$x-4 = \pm 5$$

$$\begin{array}{r} x-4=5 \\ +4 \quad +4 \\ \hline \end{array}$$

$$\boxed{x=9}$$

$$\begin{array}{r} x-4=-5 \\ +4 \quad +4 \\ \hline \end{array}$$

$$\boxed{x=-1}$$

3. $\sqrt{x+1} = \frac{100}{4}$

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

$$x+1 = \pm 5$$

$$\begin{array}{r} x+1=5 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\boxed{x=4}$$

$$\begin{array}{r} x+1=-5 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\boxed{x=-6}$$

4. $\sqrt{x-5} - 100 = 0$

$$\sqrt{(x-5)^2} = \sqrt{100}$$

$$x-5 = \pm 10$$

$$\begin{array}{r} x-5=10 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\boxed{x=15}$$

$$\begin{array}{r} x-5=-10 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\boxed{x=-5}$$

5. $\sqrt{x-1} = \frac{50}{5}$

$$\sqrt{(x-1)^2} = \sqrt{10}$$

$$x-1 = \pm \sqrt{10}$$

$$\begin{array}{r} x-1=\sqrt{10} \\ +1 \quad +1 \\ \hline \end{array}$$

$$\boxed{x=1+\sqrt{10}}$$

$$\begin{array}{r} x-1=-\sqrt{10} \\ +1 \quad +1 \\ \hline \end{array}$$

$$\boxed{x=1-\sqrt{10}}$$

6. $\sqrt{x+2} = \frac{-18}{3}$

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

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

$$\begin{array}{r} x+2=\sqrt{6} \\ -2 \quad -2 \\ \hline \end{array}$$

$$\boxed{x=-2+\sqrt{6}}$$

$$\begin{array}{r} x+2=-\sqrt{6} \\ -2 \quad -2 \\ \hline \end{array}$$

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

7. $\sqrt{x-7} = \frac{135}{5}$

$$\sqrt{(x-7)^2} = \sqrt{81}$$

$$x-7 = \pm \sqrt{81}$$

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

$$\begin{array}{r} x-7=3\sqrt{3} \\ +7 \quad +7 \\ \hline \end{array}$$

$$\boxed{x=7+3\sqrt{3}}$$

$$\begin{array}{r} x-7=-3\sqrt{3} \\ +7 \quad +7 \\ \hline \end{array}$$

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

8. $\sqrt{x+4} = \frac{96}{8}$

$$\sqrt{(x+4)^2} = \sqrt{12}$$

$$x+4 = \pm \sqrt{12}$$

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

$$\begin{array}{r} x+4=2\sqrt{3} \\ -4 \quad -4 \\ \hline \end{array}$$

$$\boxed{x=-4+2\sqrt{3}}$$

$$\begin{array}{r} x+4=-2\sqrt{3} \\ -4 \quad -4 \\ \hline \end{array}$$

$$\boxed{x=-4-2\sqrt{3}}$$

9. $\frac{1}{4}(x-8)^2 = 7.4$

$$\sqrt{(x-8)^2} = \sqrt{28}$$

$$x-8 = \pm\sqrt{28}$$

$$x-8 = \pm 2\sqrt{7}$$

$$\begin{array}{l} x-8 = 2\sqrt{7} \\ +8 \quad +8 \\ \hline x = 8 + 2\sqrt{7} \end{array} \quad \begin{array}{l} x-8 = -2\sqrt{7} \\ +8 \quad +8 \\ \hline x = 8 - 2\sqrt{7} \end{array}$$

$$\boxed{x = 8 + 2\sqrt{7}} \quad \boxed{x = 8 - 2\sqrt{7}}$$

11. $2(x-6)^2 - 46 = 53$

$$\frac{2(x-6)^2}{2} = \frac{98}{2}$$

$$\sqrt{(x-6)^2} = \sqrt{49}$$

$$x-6 = \pm 7$$

$$\begin{array}{l} x-6 = 7 \\ +6 \quad +6 \\ \hline x = 13 \end{array} \quad \begin{array}{l} x-6 = -7 \\ +6 \quad +6 \\ \hline x = -1 \end{array}$$

Directions: solve for the indicated variable.

13. $V = \frac{3}{8}\pi r^2 h$ solve for r

$$\frac{3V}{\pi h} = \frac{\pi r^2 h}{\pi h}$$

$$\sqrt{r^2} = \sqrt{\frac{3V}{\pi h}}$$

$$\boxed{r = \sqrt{\frac{3V}{\pi h}}}$$

15. $E = \frac{1}{2}mv^2$ solve for v

$$\frac{2E}{m} = \frac{mv^2}{m}$$

$$\sqrt{v^2} = \sqrt{\frac{2E}{m}}$$

$$\boxed{v = \sqrt{\frac{2E}{m}}}$$

10. $(2x-5)^2 = 81$

$$2x-5 = \pm 9$$

$$\begin{array}{l} 2x-5 = 9 \\ +5 \quad +5 \\ \hline 2x = 14 \\ \frac{2x}{2} = \frac{14}{2} \\ \hline x = 7 \end{array}$$

$$\begin{array}{l} 2x-5 = -9 \\ +5 \quad +5 \\ \hline 2x = -4 \\ \frac{2x}{2} = \frac{-4}{2} \\ \hline x = -2 \end{array}$$

$$\boxed{x = 7}$$

$$\boxed{x = -2}$$

12. $5(x+4)^2 - 8 = 17$

$$\frac{5(x+4)^2}{5} = \frac{20}{5}$$

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

$$x+4 = \pm 2$$

$$\begin{array}{l} x+4 = 2 \\ -4 \quad -4 \\ \hline x = -2 \end{array}$$

$$\begin{array}{l} x+4 = -2 \\ -4 \quad -4 \\ \hline x = -6 \end{array}$$

$$\boxed{x = -2}$$

$$\boxed{x = -6}$$

14. $a^2 + b^2 = c^2$ solve for b

$$\sqrt{b^2} = \sqrt{c^2 - a^2}$$

$$\boxed{b = \sqrt{c^2 - a^2}}$$

16. $y = a(x-h)^2 + k$ solve for x

$$\frac{y-k}{a} = \frac{a(x-h)^2}{a}$$

$$\sqrt{(x-h)^2} = \sqrt{\frac{y-k}{a}}$$

$$\begin{array}{l} x-h = \pm\sqrt{\frac{y-k}{a}} \\ +h \quad +h \\ \hline x = h \pm \sqrt{\frac{y-k}{a}} \end{array}$$

$$\boxed{x = h \pm \sqrt{\frac{y-k}{a}}}$$