

Inhale  $\times$  8

Hold  $4\times$  32

Exhale  $2\times$  16

$$11.) \quad x^2 + 10x - 11 = 0 \quad (x+11)(x-1)=0$$

$$\begin{array}{rcl} x^2 + 10x & = & 11 \\ & +25 & +25 \end{array}$$

$$\begin{array}{rcl} x^2 + 10x + 25 & = & 36 \\ \sqrt{(x+5)^2} & = & \sqrt{36} \end{array}$$

$$\begin{array}{rcl} x+5 & = & \pm 6 \\ -5 & & -5 \end{array}$$

$$x = -5 \pm 6$$

$$x = -5 + 6 = 1 \quad \text{or} \quad x = -5 - 6 = -11$$

$$17.) \quad x^2 - \frac{2}{3}x - 3 = 0$$

$$\Rightarrow x^2 - \frac{2}{3}x = 3$$

$$+ \left(\frac{2}{6}\right)^2 + \left(\frac{2}{6}\right)^2$$

$$x^2 - \frac{2}{3}x + \left(\frac{2}{6}\right)^2 = 3 + \frac{4}{36}$$

$$\sqrt{\left(x - \frac{2}{6}\right)^2} = \sqrt{\frac{28}{9}}$$

$$x - \frac{1}{3} = \sqrt{\frac{28}{9}}$$

$$+ \frac{1}{3} \quad + \frac{1}{3}$$

$$x = \frac{1}{3} + \sqrt{\frac{28}{9}}$$

$$17.) \quad x^2 - \frac{2}{3}x - 3 = 0$$

$$\left(\frac{1}{3}\right)^2 = \frac{1}{9}$$

$$3 + \frac{1}{9} =$$

$$\frac{27}{9} + \frac{1}{9} = \frac{28}{9}$$

$$\begin{array}{rcl} x^2 - \frac{2}{3}x & = & 3 \\ + \frac{1}{9} & + \frac{1}{9} & \end{array}$$

$$x^2 - \frac{2}{3}x + \frac{1}{9} = \frac{28}{9}$$

$$\sqrt{\left(x - \frac{1}{3}\right)^2} = \sqrt{\frac{28}{9}}$$

$$\begin{array}{rcl} x - \frac{1}{3} & = & \pm \sqrt{\frac{28}{9}} \\ + \frac{1}{3} & + \frac{1}{3} & \end{array}$$

$$x = \frac{1}{3} \pm \sqrt{\frac{28}{9}}$$

$$19.) x^2 + x - 1 = 0$$

$$\Rightarrow x^2 + 1x = 1$$

$$+\frac{1}{4} \quad +\frac{1}{4}$$

$$x^2 + 1x + \frac{1}{4} = \frac{5}{4}$$

$$\sqrt{\left(x + \frac{1}{2}\right)^2} = \sqrt{\frac{5}{4}}$$

$$x + \frac{1}{2} = \pm \sqrt{\frac{5}{4}}$$

$$-\frac{1}{2} \quad -\frac{1}{2}$$

$$x = -\frac{1}{2} \pm \sqrt{\frac{5}{4}}$$

$$-\frac{1}{2} \pm \sqrt{1\frac{1}{4}}$$

$$19.) \quad x^2 + x - 1 = 0$$

$$\Rightarrow x^2 + x = 1$$

$$+ \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2$$

$$x^2 + x + \left(\frac{1}{2}\right)^2 = 1 + \frac{1}{4}$$

$$\sqrt{\left(x + \frac{1}{2}\right)^2} = \sqrt{\frac{5}{4}}$$

$$x + \frac{1}{2} = \pm \sqrt{\frac{5}{4}}$$

$$-\frac{1}{2} \quad -\frac{1}{2}$$

$$x = -\frac{1}{2} \pm \sqrt{\frac{5}{4}}$$

Practice:

$$1.) \quad 1 + x - x^2 = 0$$

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

$$\Rightarrow x^2 - 1x - 1 = 0$$

Roots:

$$x = \frac{1}{2} \pm \sqrt{\frac{5}{4}}$$

Practice"

$$2.) \quad 3x^2 - 24x - 5 = 0$$

Roots:

$$x = 4 \pm \sqrt{\frac{159}{9}}$$



Practice:

$$3.) \quad 5x^2 - 20x - 20 = 5$$

Practice:

$$4.) \quad 4x^2 + 6x - 6 = 2$$

## Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Try to start with the standard form, then use Completing the Square to derive the Quadratic Formula

$$ax^2 + bx + c = 0$$