

## Finding Zeros - Factoring

Solve each equation by factoring.

$$1) r^2 + 10r + 25 = 0$$

$$(r+5)(r+5) = 0$$

$$\begin{array}{l} \downarrow \\ r+5=0 \end{array} \quad \begin{array}{l} \downarrow \\ r+5=0 \end{array}$$

$$\boxed{r=-5} \quad \boxed{r=-5}$$

$$2) x^2 + 10x + 16 = 0$$

$$(x+2)(x+8) = 0$$

$$\begin{array}{l} \downarrow \\ x+2=0 \end{array} \quad \begin{array}{l} \downarrow \\ x+8=0 \end{array}$$

$$\boxed{x=-2} \quad \boxed{x=-8}$$

$$3) x^2 + 8x + 16 = 4$$

$$x^2 + 8x + 12 = 0$$

$$(x+4)(x+2) = 0$$

$$\begin{array}{l} \downarrow \\ x+4=0 \end{array} \quad \begin{array}{l} \downarrow \\ x+2=0 \end{array}$$

$$\boxed{x=-4} \quad \boxed{x=-2}$$

$$4) a^2 - 15a + 56 = 0$$

$$(a-8)(a-7) = 0$$

$$\begin{array}{l} \downarrow \\ a-8=0 \end{array} \quad \begin{array}{l} \downarrow \\ a-7=0 \end{array}$$

$$\boxed{a=8} \quad \boxed{a=7}$$

$$5) x^2 + 24 = -10x$$

$$x^2 + 10x + 24 = 0$$

$$(x+4)(x+6) = 0$$

$$\begin{array}{l} \downarrow \\ x+4=0 \end{array} \quad \begin{array}{l} \downarrow \\ x+6=0 \end{array}$$

$$\boxed{x=-4} \quad \boxed{x=-6}$$

$$6) r^2 = 6r + 7$$

$$r^2 - 6r - 7 = 0$$

$$(r-7)(r+1) = 0$$

$$\begin{array}{l} \downarrow \\ r-7=0 \end{array} \quad \begin{array}{l} \downarrow \\ r+1=0 \end{array}$$

$$\boxed{r=7} \quad \boxed{r=-1}$$

$$7) -4v^2 + 32 = 8 - 5v^2 + 10v$$

$$v^2 - 10v + 24 = 0$$

$$(x-6)(x-4) = 0$$

$$\begin{array}{l} \downarrow \\ x-6=0 \end{array} \quad \begin{array}{l} \downarrow \\ x-4=0 \end{array}$$

$$\boxed{x=6} \quad \boxed{x=4}$$

$$8) -4b^2 + 7b + 16 = -b - 5b^2$$

$$b^2 + 8b + 16 = 0$$

$$(b+4)(b+4) = 0$$

$$\begin{array}{l} \downarrow \\ b+4=0 \end{array} \quad \begin{array}{l} \downarrow \\ b+4=0 \end{array}$$

$$\boxed{b=-4} \quad \boxed{b=-4}$$