

Do Now:

a) Solve for all value(s) of x:

$$(2x+1)(3x-5)=0$$

$$\begin{array}{r|l} 2x+1=0 & 3x-5=0 \\ -1 & +5 \\ \hline 2x & = -1 \\ \hline x & = -\frac{1}{2} \end{array} \quad \begin{array}{r|l} 3x-5=0 & \\ +5 & +5 \\ \hline 3x & = 5 \\ \hline x & = \frac{5}{3} \end{array}$$

b) Find the roots of $x^2=2x$

$$\begin{array}{r} x^2 - 2x = 0 \\ -2x \quad -2x \\ \hline x^2 - 2x = 0 \\ x \quad | \quad (x-2) = 0 \\ \hline x=0 \quad | \quad x-2=0 \\ \quad \quad \quad +2 \quad +2 \\ \hline \quad \quad \quad x=2 \end{array}$$

AIM: SOLVING QUADRATIC EQUATIONS (Day 3)

1. Solve for the roots: $x^2+4x=5$

$$\begin{array}{r} x^2+4x-5=0 \\ -5 \quad -5 \\ \hline (x+5)(x-1)=0 \\ \hline x+5=0 \quad | \quad x-1=0 \\ -5 \quad -5 \quad | \quad +1 \quad +1 \\ \hline x=-5 \quad | \quad x=1 \end{array}$$

$\{-5, 1\}$

2. Solve for x: $x^2=36$

$$\begin{array}{r} x^2=36 \\ -36 \quad -36 \\ \hline x^2-36=0 \\ (x+6)(x-6)=0 \\ \hline x+6=0 \quad | \quad x-6=0 \\ -6 \quad -6 \quad | \quad +6 \quad +6 \\ \hline x=-6 \quad | \quad x=6 \end{array}$$

$\{\pm 6\}$

3. What are the x-intercepts?

$$\begin{array}{r} x^2=8x-15 \\ -8x \quad -8x \\ \hline x^2-8x=-15 \\ +15 \quad +15 \\ \hline x^2-8x+15=0 \\ (x-5)(x-3)=0 \\ \hline x-5=0 \quad | \quad x-3=0 \\ +5 \quad +5 \quad | \quad +3 \quad +3 \\ \hline x=5 \quad | \quad x=3 \end{array}$$

$\{5, 3\}$

4. Find the zeroes of the function $y=2x^2-50$

$$\begin{array}{r} 0=2x^2-50 \\ \frac{0}{2} = \frac{2x^2-50}{2} \\ 2(x^2-25)=0 \\ 2(x-5)(x+5)=0 \\ \hline x-5=0 \quad | \quad x+5=0 \\ +5 \quad +5 \quad | \quad -5 \quad -5 \\ \hline x=5 \quad | \quad x=-5 \end{array}$$

$\{\pm 5\}$

5. What are the x-intercepts? $2x^2 + x - 6 = 0$

$$\frac{2x^2}{2x} + \frac{4x}{2x} \quad | \quad \frac{-3x}{-3} - \frac{6}{3} = 0$$

$$\frac{2x(x+2)}{(x+2)} \quad | \quad \frac{-3(x+2)}{-3(x+2)} = 0$$

$$\begin{array}{r} 12 \\ 112 \\ \hline 216 \\ \hline \boxed{34} \end{array}$$

$$\frac{(x+2)|(2x-3) = 0}{\begin{array}{l|l} x+2=0 & 2x-3=0 \\ \hline -2 & +3 \\ \hline x=-2 & \frac{2x}{2} = \frac{3}{2} \\ & x = \frac{3}{2} \end{array}}$$

$$\left\{ -2, \frac{3}{2} \right\}$$

6. Solve for the roots: $\frac{x}{14} = \frac{2}{x-3}$

$$\begin{array}{l} x(x-3) = 2(14) \\ x^2 - 3x = 28 \\ \underline{-28 \quad -28} \end{array}$$

$$x^2 - 3x - 28 = 0$$

$$\frac{(x-7)|(x+4) = 0}{\begin{array}{l|l} x-7=0 & x+4=0 \\ \hline +7 & -4 \\ \hline x=7 & x=-4 \end{array}}$$

$$\left\{ -4, 7 \right\}$$

Partner Practice

7. Find the zeroes of the function $x^2 = 121$

$$\begin{array}{l} \frac{-121 \quad -121}{x^2 - \sqrt{121} = 0} \\ (x-11)(x+11) = 0 \\ \hline \begin{array}{l} x-11=0 \\ +11 \quad +11 \\ \hline x=11 \end{array} \quad \begin{array}{l} x+11=0 \\ -11 \quad -11 \\ \hline x=-11 \end{array} \end{array} \quad \{ \pm 11 \}$$

8. Find the x-intercepts: $x^2 - 10x = 0$

$$\begin{array}{l} \frac{x \quad x}{x^2 - 10x = 0} \\ x(x-10) = 0 \\ \hline \begin{array}{l} x=0 \\ x-10=0 \\ +10 \quad +10 \\ \hline x=10 \end{array} \end{array} \quad \{ 0, 10 \}$$

9. Find the roots: $x^2 - x = 20$

$$\begin{array}{l} \frac{-20 \quad -20}{x^2 - x - 20 = 0} \\ (x-5)(x+4) = 0 \\ \hline \begin{array}{l} x-5=0 \\ +5 \quad +5 \\ \hline x=5 \end{array} \quad \begin{array}{l} x+4=0 \\ -4 \quad -4 \\ \hline x=-4 \end{array} \end{array} \quad \{ 5, -4 \}$$

10. Find the x-intercepts: $2x^2 + 8x - 10 = 0$

$$\begin{array}{l} \frac{2 \quad 2 \quad 2}{2(x^2 + 4x - 5) = 0} \\ 2(x+5)(x-1) = 0 \\ \hline \begin{array}{l} 2x \\ x+5=0 \\ -5 \quad -5 \\ \hline x=-5 \end{array} \quad \begin{array}{l} x-1=0 \\ +1 \quad +1 \\ \hline x=1 \end{array} \end{array} \quad \{ -5, 1 \}$$

11. Find the zeroes of the function $3x^2 + 13x + 4 = 0$

$$\begin{array}{l} \frac{12}{3x^2 + 12x \quad | \quad 1x + 4 = 0} \\ \begin{array}{l} 3x \quad 3x \\ \hline 3x(x+4) \end{array} \quad \begin{array}{l} 1x+4 \\ \hline 1(x+4) \end{array} \\ \hline \begin{array}{l} (x+4)(3x+1) = 0 \\ \hline \begin{array}{l} x+4=0 \\ -4 \quad -4 \\ \hline x=-4 \end{array} \quad \begin{array}{l} 3x+1=0 \\ -1 \quad -1 \\ \hline 3x = -1 \\ \frac{3x}{3} = \frac{-1}{3} \\ x = -\frac{1}{3} \end{array} \end{array} \quad \{ -4, -\frac{1}{3} \}$$

12. Find the x-intercepts: $6x^2 - 7x - 5 = 0$

$$\begin{array}{l} \frac{30}{6x^2 - 10x \quad | \quad 3x - 5 = 0} \\ \begin{array}{l} 2x \quad 2x \\ \hline 2x(3x-5) \end{array} \quad \begin{array}{l} 3x-5 \\ \hline 1(3x-5) \end{array} \\ \hline \begin{array}{l} (3x-5)(2x+1) = 0 \\ \hline \begin{array}{l} 3x-5=0 \\ +5 \quad +5 \\ \hline 3x = 5 \\ \frac{3x}{3} = \frac{5}{3} \\ x = \frac{5}{3} \end{array} \quad \begin{array}{l} 2x+1=0 \\ -1 \quad -1 \\ \hline 2x = -1 \\ \frac{2x}{2} = \frac{-1}{2} \\ x = -\frac{1}{2} \end{array} \end{array} \quad \{ \frac{5}{3}, -\frac{1}{2} \}$$