Name:_____ Date:_____
UNIT 9 **LESSON 4**

Do Now:

a) Solve for all value(s) of x:
$$(2x+1)(3x-5)=0$$

$2x+1=0 \quad | \quad 3x-5=0$
$\quad -1 \ -1 \quad | \qquad +5 \ +5$

$\dfrac{2x}{2}=\dfrac{-1}{2} \quad | \quad \dfrac{3x}{3}=\dfrac{5}{3}$

$x=-\dfrac{1}{2} \qquad x=\dfrac{5}{3}$

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

$-2x \ -2x$

$\dfrac{x^2-2x=0}{x}$

$x(x-2)=0$

$\boxed{x=0} \qquad x-2=0$
$\qquad\qquad\qquad +2 \ +2$
$\qquad\qquad\qquad \boxed{x=2}$

AIM: SOLVING QUADRATIC EQUATIONS (Day 3)

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

$\dfrac{-5 \ -5}{x^2+4x-5=0}$

$(x+5) \ | \ (x-1)=0$

$x+5=0 \quad | \quad x-1=0$
$\ -5 \ -5 \quad | \qquad +1 \ +1$

$x=-5 \qquad x=1$

$\{-5,1\}$

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

$x=\pm 6 \qquad *\text{or}*$

$x^2=36$
$\dfrac{-36 \ -36}{x^2-36=0}$

$(x+6) \ | \ (x-6)=0$

$x+6=0 \quad | \quad x-6=0$
$\ -6 \ -6 \quad | \qquad +6 \ +6$

$x=-6 \qquad x=6$

$\{\pm 6\}$

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3. What are the x-intercepts?

$$x^2=8x-15$$
$-8x \ -8x$

$x^2-8x=-15$
$\qquad +15 \quad +15$

$x^2-8x+15=0$

$(x-5) \ | \ (x-3)=0$

$x-5=0 \quad | \quad x-3=0$
$\ +5 \ +5 \quad | \qquad +3 \ +3$

$x=5 \qquad x=3$

$\{5,3\}$

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

$0=\dfrac{2x^2-50}{2}$

$2(x^2-25)=0$

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

$2\!\!\!/ \ | \ x-5=0 \quad | \quad x+5=0$
$\qquad +5 \ +5 \quad | \qquad -5 \ -5$

$x=5 \qquad x=-5$

$\{\pm 5\}$

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

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

same

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

$$\dfrac{(x+2)(2x-3) = 0}{}$$

$$
\begin{array}{c|c}
x+2=0 & 2x-3=0 \\
\;-2\;\;-2 & \quad +3\;\;+3 \\
\hline
x=-2 & \dfrac{2x}{2} = \dfrac{3}{2} \\
 & x = \dfrac{3}{2}
\end{array}
$$

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

$\dfrac{12}{}$

$1 \cdot 12$
$2 \cdot 6$
$\boxed{3 \cdot 4}$

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

$x(x-3) = 2(14)$

$x^2 - 3x = 28$

$\;\;-28 \quad -28$

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

$(x-7)(x+4) = 0$

$$
\begin{array}{c|c}
x-7=0 & x+4=0 \\
+7\;\;+7 & \;-4\;\;+4 \\
\hline
x=7 & x=-4
\end{array}
$$

$\{-4, 7\}$

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

$$-121 \quad -121$$
$$\sqrt{x^2 - 121} = 0$$
$$(x - 11)(x + 11) = 0$$
$$x - 11 = 0 \qquad x + 11 = 0$$
$$+11 \quad +11 \qquad -11 \quad -11$$
$$x = 11 \qquad x = -11 \quad \{\pm 11\}$$

8. Find the x-intercepts: $\dfrac{x^2 - 10x}{x} = \dfrac{0}{x}$

$$x(x - 10) = 0$$
$$x = 0 \qquad x - 10 = 0$$
$$+10 \quad +10$$
$$x = 10$$
$$\{0, 10\}$$

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

$$-20 \quad -20$$
$$x^2 - x - 20 = 0$$
$$(x - 5)(x + 4) = 0$$
$$x - 5 = 0 \qquad x + 4 = 0$$
$$+5 \quad +5 \qquad -4 \quad -4$$
$$x = 5 \qquad x = -4 \quad \{5, -4\}$$

10. Find the x-intercepts: $\dfrac{2x^2 + 8x - 10}{2} = \dfrac{0}{2} \dfrac{}{2}$

$$2(x^2 + 4x - 5) = 0$$
$$2(x + 5)(x - 1) = 0$$
$$2 \neq 0 \quad x + 5 = 0 \qquad x - 1 = 0$$
$$-5 \quad -5 \qquad +1 \quad +1$$
$$x = -5 \qquad x = 1 \quad \{-5, 1\}$$

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

$$\dfrac{3x^2 + 12x}{3x} \;\Big|\; \dfrac{1x + 4}{3x} = 0$$

12
2, 6
3, 4

$$\xrightarrow{\text{same}}$$
$$3x(x + 4) \;\Big|\; 1(x + 4) = 0$$
$$(x + 4)$$
$$(x + 4)(3x + 1) = 0$$
$$x + 4 = 0 \qquad 3x + 1 = 0$$
$$-4 \quad -4 \qquad -1 \quad -1$$
$$x = -4 \qquad \dfrac{3x}{3} = \dfrac{-1}{3}$$
$$x = -\dfrac{1}{3}$$
$$\left\{-4, -\dfrac{1}{3}\right\}$$

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

$$\dfrac{6x^2 - 10x}{2x} \;\Big|\; \dfrac{+3x - 5}{2x} = 0$$

30
1, 30
2, 15
3, 10

$$2x(3x - 5) \;\Big|\; 1(3x - 5) = 0$$
$$(3x - 5)$$
$$(3x - 5)(2x + 1) = 0$$
$$3x - 5 = 0 \qquad 2x + 1 = 0$$
$$+5 \quad +5 \qquad -1 \quad -1$$
$$\dfrac{3x}{3} = \dfrac{5}{3} \qquad \dfrac{2x}{2} = \dfrac{-1}{2}$$
$$x = \dfrac{5}{3} \qquad x = -\dfrac{1}{2}$$
$$\left\{\dfrac{5}{3}, -\dfrac{1}{2}\right\}$$