Name:_____ Date:_____

UNIT 8 **LESSON 8**

DO NOW: Which equation has the same solutions as $2x^2 + x - 3 = 0$

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

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

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

4) $(2x+3)(x-1)=0$

$\frac{2x^2}{x} + \frac{3x}{x} \mid \frac{-2x}{-1} - \frac{3}{-1} = 0$

$x(2x+3) \mid -1(2x-3)=0$

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

AIM: COMPLETING THE SQUARE ($a \neq 1$)

1. Solve for x in simplest radical form by completing the square:

Steps:

1.	If "a" value is not equal to 1, divide both sides of the equation by the leading coefficient.
2.	Move the constant ("c" value) to the right side. (The "a" value must be equal to 1!)
3.	Make the left side a perfect square trinomial: Take half of the "b" value
4.	Square it.
5.	Add it to BOTH sides.
6.	Factor the perfect square trinomial and simplify right side.
7.	Take the square root of both sides and solve! **(Remember positive and negative results!!!!)**

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

$x^2 - 4x - 1 = 0$

$+1 \quad +1$

$x^2 - 4x = 1$

b-value

$\frac{-4}{2} = (-2)^2 = 4$

$x^2 - 4x + 4 = 1 + 4$

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

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

$x - 2 = \pm\sqrt{5}$

$+2 \quad +2$

$x = 2 \pm \sqrt{5}$

$\{2 \pm \sqrt{5}\}$

2. Solve for the roots in simplest radical form: $\frac{10x^2}{10}+\frac{20x}{10}=\frac{100}{10}$

1.	If "a" value is not equal to 1, divide both sides of the equation by the leading coefficient.
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$x^2+2x=10$

b-value

$\frac{2}{2}=(1)^2=1$

$x^2+2x+1=10+1$

$(x+1)(x+1)=11$

$\sqrt{(x+1)^2}=\pm\sqrt{11}$

$x+1=\pm\sqrt{11}$

$-1 \quad -1$

$x=-1\pm\sqrt{11}$

$\{-1\pm\sqrt{11}\}$

3. Find the zeros of the function to the nearest tenth: $\frac{3x^2}{3}-\frac{24x}{3}+\frac{12}{3}=\frac{0}{3}$

$x^2-8x+4=0$

$-4 \quad -4$

$x^2-8x=-4$

b-value:

$\left(\frac{-8}{2}\right)=(-4)^2=16$

$x^2-8x+16=-4+16$

$(x-4)(x-4)=12$

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

$x-4=\pm\sqrt{4}\sqrt{3}$

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

$+4 \quad +4$

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

$\{4\pm 2\sqrt{3}\}$

4. Find the solution set in simplest radical form: $3x^2 - 12x - 24 = 0$

$\frac{3}{3}\ \frac{3}{3}\ \frac{3}{3}\ \frac{3}{3}$

$x^2 - 4x - 8 = 0$

$+8 \quad +8$

$x^2 - 4x = 8$

b-value: $\frac{-4}{2} = (-2)^2 = 4$

$x^2 - 4x + 4 = 8 + 4$

$(x-2)(x-2) = 12$

$\sqrt{(x-2)^2} = \pm\sqrt{12}$

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

$x - 2 = \pm 2\sqrt{3}$

$+2 \quad +2$

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

$\{2 \pm 2\sqrt{3}\}$

1.	If "a" value is not equal to 1, divide both sides of the equation by the leading coefficient.
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7.	Take the square root of both sides and solve! **(Remember positive and negative results!!!!)**

5. Find the roots to the nearest hundredth: $5x^2 + 10x - 5 = 0$

$\frac{5}{5}\ \frac{5}{5}\ \frac{5}{5}\ \frac{5}{5}$

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

$+1 \quad +1$

$x^2 + 2x = 1$

b-value: $\frac{2}{2} = (1)^2 = 1$

$x^2 + 2x + 1 = 1 + 1$

$(x+1)(x+1) = 2$

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

$x + 1 = \pm\sqrt{2}$

$-1 \quad -1$

$x = -1 \pm \sqrt{2}$

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

1.	If "a" value is not equal to 1, divide both sides of the equation by the leading coefficient.
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6. Find the x-intercepts in simplest radical form: $\frac{2x^2}{2} + \frac{12x}{2} = \frac{18}{2}$

$x^2 + 6x = 9$

b-value: $\frac{6}{2} = (3)^2 = 9$

$x^2 + 6x + 9 = 9 + 9$

$(x+3)(x+3) = 18$

$\sqrt{(x+3)^2} = \pm\sqrt{18}$

$x + 3 = \pm\sqrt{9}\sqrt{2}$

$-3 \quad -3$

$x = -3 \pm 3\sqrt{2}$

$\{-3 \pm 3\sqrt{2}\}$

7. Solve for x in simplest radical form: $\frac{2x^3}{2x} - \frac{16x^2}{2x2x} - \frac{4x}{2x2x} = \frac{0}{2x}$

b-value: $-\frac{8}{2} = (-4)^2 = 16$

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

$+2 \quad +2$

$x^2 - 8x = 2$

$x^2 - 8x + 16 = 2 + 16$

$(x-4)(x-4) = 18$

$(x-4)^2 = \pm\sqrt{18}$

$x - 4 = \pm\sqrt{9}\sqrt{2}$

$+4 \quad +4$

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

$\{4 \pm 3\sqrt{2}\}$