

# 8.7 – 8.9 Review Solving Quadratic Equations

Ex1) Solve by factoring:

a)  $x^2 - 5x - 6 = 0$

$(x-6)(x+1) = 0$	$\begin{array}{r} 1 \quad -6 \\ 1 \quad X \quad 1 \\ \hline -6 + 1 = -5 \quad \checkmark \end{array}$
$x-6=0$	$x+1=0$
$+6 +6$	$-1 \quad -1$
$x=6$	$x=-1$

b)  $2x^2 - 4x = 6$

$2x^2 - 4x - 6 = 0$	$\begin{array}{r} 1 \quad -3 \\ 2 \quad X \quad 2 \\ \hline -6 + 2 = -4 \quad \checkmark \end{array}$
$(x-3)(2x+2) = 0$	
$x-3=0$	$2x+2=0$
$+3 +3$	$-2 \quad -2$
$x=3$	$\frac{2x}{2} = \frac{-2}{2}$
	$x=-1$

## Ex2) Solve by the square root property:

a)  $4x^2 - 44 = 0$   $b=0$

$\uparrow$      $+44$      $+44$

Solve for  $x^2$

$$\frac{4x^2}{4} = \frac{44}{4}$$

$$\sqrt{x^2} = \sqrt{11}$$

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

b)  $3x^2 - 1 = 47$

$+1$      $+4$

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$$\frac{3x^2}{3} = \frac{48}{3}$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

### Ex3) Solve by Completing the Square:

$$a) \quad x^2 + 14x - 29 = 0 \quad \frac{b}{2} = 7$$
$$\qquad \qquad \qquad + 29 \quad + 29$$

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$$x^2 + 14x + 49 = 29 + 49$$

$(\frac{b}{2})^2$   $(\frac{b}{2})^2$

$\sqrt{(x+7)^2} = \sqrt{78}$  add

$$x + 7 = \pm \sqrt{78}$$

$$\quad -7 \quad -7$$

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$$x = -7 \pm \sqrt{78}$$

$$b) \quad x^2 - 8x + 10 = 0$$
$$\qquad \qquad \qquad - 10 \quad - 10$$

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$$x^2 - 8x + 16 = -10 + 16$$
$$\sqrt{(x-4)^2} = \sqrt{6}$$

$$x - 4 = \pm \sqrt{6}$$

$$x = 4 \pm \sqrt{6}$$

### Ex4) Solve by Quadratic Formula:

$$a) \quad x^2 - 3x - 10 = 0 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad b) \quad x^2 - 5x + 3 = 0$$

$$a=1, b=-3, c=-10$$

$$x = \frac{3 \pm \sqrt{9 - 4(1)(-10)}}{2(1)}$$

$$= \frac{3 \pm \sqrt{9 + 40}}{2}$$

$$= \frac{3 \pm \sqrt{49}}{2} = \frac{3 \pm 7}{2}$$

$$\frac{3+7}{2} = \boxed{5}$$

$$\frac{3-7}{2} = \boxed{-2}$$

$$a=1, b=-5, c=3$$

$$x = \frac{5 \pm \sqrt{25 - 4(1)(3)}}{2(1)}$$

$$= \frac{5 \pm \sqrt{25 - 12}}{2} = \boxed{\frac{5 \pm \sqrt{13}}{2}}$$

Ex5) Use the Discriminant to state the number of real solutions.

$$b^2 - 4ac$$

$$\begin{array}{r} a) \quad x^2 - 4x + 5 = 8 \\ \quad \quad \quad -8 \quad -8 \\ \hline \end{array}$$

$$x^2 - 4x - 3 = 0$$

$$a = 1$$

$$b = -4$$

$$c = -3$$

$$b^2 - 4ac = 16 - 4(1)(-3)$$

$$= 16 + 12$$

$$= 28 > 0$$

2 Real Solutions

$$\begin{array}{r} c) \quad x^2 + 3x + 8 = 2 \\ \quad \quad \quad -2 \quad -2 \\ \hline \end{array}$$

$$x^2 + 3x + 6 = 0$$

$$b^2 - 4ac = 9 - 4(1)(6) = 9 - 24 = -15 < 0$$

0 Real Solution

$$b) \quad x^2 + 6x + 9 = 0$$

$$b^2 - 4ac = 36 - 4(1)(9)$$

$$= 36 - 36$$

$$= 0$$

1 Real Solution

# Ex6) Simplify Radical Expressions.

a)  $\sqrt{96x^4y^5} = 2 \cdot 2x^2y^2 \sqrt{6y}$

$\sqrt{48}$   
 $\sqrt{24}$   
 $\sqrt{12}$   
 $\sqrt{6}$   
 $2^3 = 8$

$4x^2y^2 \sqrt{6y}$

$(xx)(xx)$   
 $(yy)(yy)y$

b)  $\sqrt{108x^3y^7} = 2 \cdot 3xy^3 \sqrt{3xy}$

$\sqrt{54}$   
 $\sqrt{27}$   
 $\sqrt{9}$   
 $\sqrt{3}$

$6xy^3 \sqrt{3xy}$

$(xxx)$   
 $(yy)(yy)y$