

## Bell Ringer

Wednesday 9/26

Factor.

$$1. x^2 - 49 \quad x^2 + 0x - 49$$

$$(x + 7)(x - 7)$$

$$2. 3x^2 - 75 \quad 3(x^2 - 25)$$

$$3(x - 5)(x + 5)$$

$$3. 2x^2 + 72$$

$$2(x^2 + 36)$$

$$4. x^2 - 12x + 20$$

$$(x - 2)(x - 10) \quad \begin{array}{cc} 20 & \\ -2 & -10 \\ -2 & \end{array}$$

6 minutes

**1 - Organize folders**

- update pink sheet
- passed on right, need to correct on left
- name on folder, folder in bin

**2 - Fill out PTC form**

- keep face down on desk when finished

done early? work on blue ws - due tomorrow

### Review

Simplify and leave answers in exact form (no decimals)

$$\sqrt{28} = 2\sqrt{7}$$

Handwritten work:  $\sqrt{28}$  with arrows pointing to 7 and 4, and a circled  $2 \cdot 2$  below.

$$\sqrt{45} = 3\sqrt{5}$$

Handwritten work:  $\sqrt{45}$  with arrows pointing to 9 and 5, and a circled  $3 \cdot 3$  below.

$$4 + \sqrt{8} = 2\sqrt{2}$$

Handwritten work:  $4 + \sqrt{8}$  with arrows pointing to 4 and 8, and a circled  $2 \cdot 2$  below. The final result is  $4 + 2\sqrt{2}$ .

$$\frac{\sqrt{50}}{5} = \frac{5\sqrt{2}}{5} = \sqrt{2} \quad \frac{6 + \sqrt{72}}{3} =$$

$$\sqrt{50} = 5\sqrt{2}$$

Handwritten work:  $\sqrt{50}$  with arrows pointing to 25 and 2, and a circled  $5 \cdot 2$  below.

$$\frac{5\sqrt{2}}{5}$$

Handwritten work:  $\frac{5\sqrt{2}}{5}$  with a diagonal line through the 5s.

$$\sqrt{72} = 3 \cdot 2\sqrt{2} = 6\sqrt{2}$$

Handwritten work:  $\sqrt{72}$  with arrows pointing to 36 and 2, and circled  $3 \cdot 3$  and  $2 \cdot 2$  below.

$$\frac{6 + 6\sqrt{2}}{3}$$

$$\frac{6}{3} + \frac{6\sqrt{2}}{3} = 2 + 2\sqrt{2}$$

## 3.7 Solving Quadratics with the Quadratic Formula

pg 176

Identify a, b, and c

$$\underline{ax^2 + bx + c = 0}$$

$$3x^2 - 4x + 7$$

$$a = 3$$

$$b = -4$$

$$c = 7$$

$$x^2 + 2x - 11$$

$$a = 1$$

$$b = 2$$

$$c = -11$$

$$-5x^2 + x + 8$$

$$a = -5$$

$$b = 1$$

$$c = 8$$

Can you factor and solve this...

$$\underline{2}x^2 - 8x - \underline{1} = 0$$

A diagram showing a failed attempt at factoring the quadratic equation  $2x^2 - 8x - 1 = 0$ . It features two intersecting diagonal lines forming an 'X'. The number  $-2$  is written in blue above the intersection, and  $-8$  is written in blue below it. A plus sign  $+$  is written in blue to the left of the intersection, and a minus sign  $-$  is written in blue to the right of it.

Quadratic Formula...

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

How can you remember this...?



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 2$$

$$b = -8$$

$$c = -1$$

Solve for x

$$2x^2 - 8x - 1 = 0$$

$$\frac{8 \pm \sqrt{(-8)^2 - 4(2)(-1)}}{2(2)}$$

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

$$\frac{8 \pm \sqrt{64 + 8}}{4} =$$

$$\frac{8 \pm \sqrt{72}}{4}$$

$$\sqrt{72} = 6\sqrt{2}$$

$$= \frac{8 \pm 6\sqrt{2}}{4} = \frac{4 \pm 3\sqrt{2}}{2}$$

$$a \cdot c = 2 \cdot (-1) = -2$$



Guess what... the Quadratic Formula works for **ALL** trinomials!!!!!!



$$ax^2 + bx + c = 0$$

"Got it" on pg. 177  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Regular factoring

$$x^2 - 4x = 21$$

-21 | -21

$$x^2 - 4x - 21 = 0$$

$$\begin{array}{r} -21 \\ +3 \quad -7 \\ -4 \end{array} \quad (x+3)(x-7) = 0$$

$$x+3=0 \quad x-7=0$$

-3      -7

$$x = -3, 7$$

Quadratic formula

$$x^2 - 4x = 21 \quad \begin{array}{l} a=1 \\ b=-4 \\ c=-21 \end{array}$$

$$x^2 - 4x - 21 = 0$$

$$x = \frac{4 \pm \sqrt{(-4)^2 - 4(1)(-21)}}{2(1)}$$

$$= \frac{4 \pm \sqrt{100}}{2}$$

$$\frac{4 \pm 10}{2} = \frac{14}{2} \quad \frac{-6}{2}$$

$$7, -3$$


**Problem 3**
**Choosing an Appropriate Method**

not in book

Which method(s) would you choose to solve the equation? Explain your reasoning.

**A**  $3x^2 - 9 = 0$   
~~+1 +0~~

$$3x^2 = 9$$

$$\text{sqrt.}$$

**B**  $x^2 - x - 30 = 0$

~~$$\begin{array}{r} -30 \\ -6 \quad +5 \\ -1 \end{array}$$~~

$$\text{factor}$$

**C**  $6x^2 + 13x - 17 = 0$

$$\text{quad.}$$
~~$$\begin{array}{r} -102 \\ +13 \end{array}$$~~

**D**  $x^2 - 5x + 3 = 0$

~~$$\begin{array}{r} +3 \\ -1 \quad -5 \\ -1 \quad -3 \end{array}$$~~

$$\text{quad.}$$

**E**  $-16x^2 - 50x + 21 = 0$

$$\text{quad.}$$

"Got it" pg. 180

Which method(s) would you choose to solve each equation?  
Why?

a.  $x^2 - 8x + 12 = 0$   ~~$-2 \times 12$~~   
 $-8$   ~~$-6$~~   
fact

b.  $169x^2 = 36$   $\sqrt{169}$  sqrt.  $169x^2 + 0x - 36 = 0$

c.  $5x^2 + 13x - 1 = 0$   
 ~~$-5$~~   
 $+13$  . quad

"Got it" pg 180 - part c

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve for x

$$5x^2 + 13x - 1 = 0$$

$$a = 5$$

$$b = 13$$

$$c = -1$$

$$\begin{array}{r} \sqrt{189} \\ \swarrow \quad \searrow \\ 3 \quad \cancel{63} \\ \quad \quad \swarrow \quad \searrow \\ \quad \quad 7 \quad \cancel{27} \\ \quad \quad \quad \quad \swarrow \quad \searrow \\ \quad \quad \quad \quad \quad \quad 3 \quad 3 \end{array}$$

$$\frac{-(13) \pm \sqrt{(13)^2 - 4(5)(-1)}}{2(5)} = \frac{-13 \pm \sqrt{189}}{10}$$

$$\frac{-13 \pm 3\sqrt{21}}{10}$$

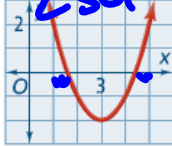
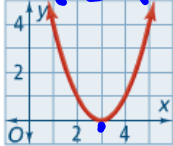
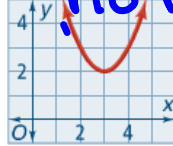
The part under the radical sign is called the "discriminant"

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

It can help you determine how many solutions there are to a quadratic equation...

pg. 181

**Take note** **Key Concept Using the Discriminant**

Discriminant	$b^2 - 4ac > 0$	$b^2 - 4ac = 0$	$b^2 - 4ac < 0$
<b>Example</b>	$x^2 - 6x + 7 = 0$ The discriminant is $(-6)^2 - 4(1)(7) = 8$ , which is positive.	$x^2 - 6x + 9 = 0$ The discriminant is $(-6)^2 - 4(1)(9) = 0$ .	$x^2 - 6x + 11 = 0$ The discriminant is $(-6)^2 - 4(1)(11) = -8$ , which is negative.
			
<b>Number of Solutions</b>	There are two real-number solutions.	There is one real-number solution.	There are no real-number solutions.
	<b>positive</b>	<b>zero</b>	<b>negative</b>

$b^2 - 4ac =$



### Problem 4

### Using the Discriminant

not in book

How many real-number solutions does  $2x^2 - 3x = -5$  have?

Try the got it on pg. 182

a. How many real-number solutions does  $6x^2 - 5x = 7$  have?

$$b^2 - 4ac$$

$$(-5)^2 - 4(6)(-7)$$

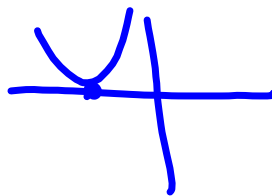
$$25 + 168 = +$$

pos

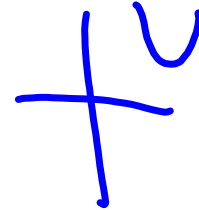


$$6x^2 - 5x - 7 = 0$$

$$= 0$$



$$= -$$



**due Monday**

SMII

Name: \_\_\_\_\_

Discriminant and Quadratic Formula

Hour: \_\_\_\_\_

**Find the discriminant of each quadratic equation then state the number and type of solutions.**

1)  $-k^2 + 2k + 3 = 0$

2)  $9x^2 - x + 12 = 0$

3)  $-4n^2 - 12n - 9 = 0$

4)  $4p^2 + 6p + 7 = 11$

**Solve each equation with the quadratic formula.**

5)  $10n^2 - 8 = 0$

6)  $4x^2 + 2x - 110 = 0$

7)  $8x^2 + 12x - 9 = 0$

8)  $2k^2 - 3k - 12 = 5$



