Alg2T Warm Up Ch 4 Day 4

***Quiz Friday 21st

If the solution to the equation $(x+a)(x+b)=0$ are $x=6$ and $x=-4$, then $a+b=?$

F. -24
G. -12
H. -2
J. 2
K. 24

Monday 24th

Which of the following are the values of x for which $2x^2=3-5x$?

A. $-\frac{1}{2}$ and 3
B. -1 and $\frac{3}{2}$
C. $-\frac{3}{2}$ and 1
D. -2 and 3
E. -3 and $\frac{1}{2}$

Homework Questions???????

Let's look at #62
$h=-16t^2+32t+6$, find the maximum height of the baton.

20.) $169/4, (x-13/2)^2$
22.) $-2\pm\sqrt{14}$
24.) $-3\pm2\sqrt{3}$
28.) $-4\pm\sqrt{10}$
30.) $5\pm2\sqrt{7}$
42.) $y=(x-2)^2-5$, (2, -5)
44.) $y=(x+10)^2-10$, (-10,-10)
50.) $x=-5\pm2\sqrt{3}$
62.) 22ft

Worksheet 4.7

#'s 10-14, 17, 20, 22, 26, 27

Warm Up

What value of c makes the trinomial a perfect square binomial. Write the trinomial as a square binomial.

1.) $x^2 + 10x + c$

Solve by completing the square.

2.) $x^2 - 14x + 9 = 0$

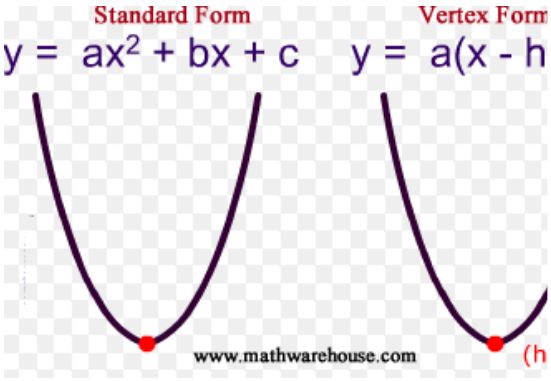
II. Use completing the square to solve. TOYO:

4.) $3x^2+12x-18=0$

Example

III. Write in vertex form. Identify the vertex.

1.) $y=x^2+2x+5$



Write in vertex form. Identify the vertex.

$y = x^2 - 4x + 10$

Algebra 2 Trig Daily Learning Target Quiz
Completing the Square Day 4

1.) Find the c value that makes the expression a perfect trinomial. Then rewrite as a binomial squared. $x^2 - 14x + c$	2.) Solve. $x^2 + 8x + 4 = 0$
3.) Write in vertex form. $y = x^2 - 6x + 5$	4.) What does it mean to be a solution?

Alg2T Extra Credit Ch 4 Day 4

For which of the following values of b will there be 2 distinct real solutions to the equation $2x^2 - bx + 6 = 0$?

F. $4\sqrt{3}$
G. $-4\sqrt{3}$
H. -2
J. 0
K. 7

Ch 4
Quadratic Functions
(4.8/4.6)Quadratic Formula, The Discriminant,and Imaginary

The Quadratic Formula

We can sing, if you want to...

https://www.youtube.com/watch?v=2lbABbfU6Zc

$$If\ \ y = ax^2 + bx + c$$

$$then\ the\ x-\text{intercepts}\ or\ roots\ are$$

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

I. Use the quadractic formula to solve.

Example

1.) $3x^2 + 8x = 35$

I. Use the quadractic formula to solve.

Example

2.) $12x - 5 = 2x^2 + 13$

I. Use the quadractic formula to solve.

Example

3.) $-2x^2 = -2x + 3$

The Discriminant

$$b^2 - 4ac$$

What is it good for?

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$ ← the $b^2 - 4ac$ part is the Discriminant

When:

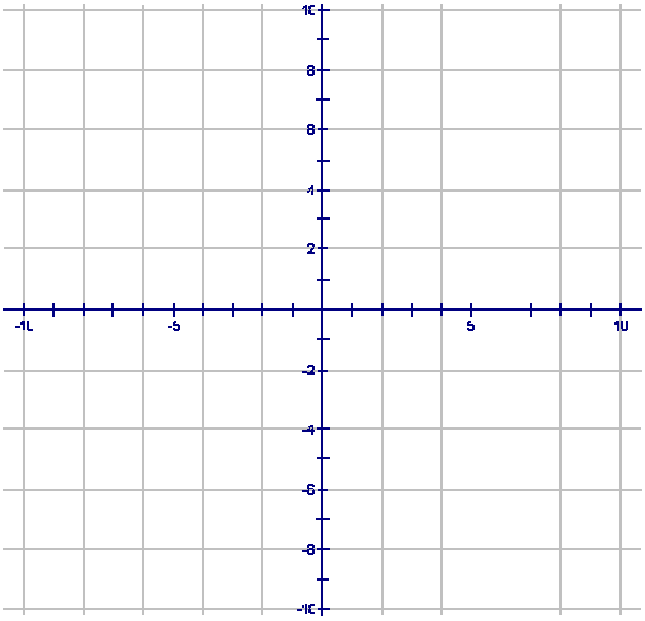
$b^2 - 4ac = 0$	$b^2 - 4ac =$ positive	$b^2 - 4ac =$ Negative
↓	↓	↓
1 double root	2 real roots	No real roots or 2 imaginary

~~Note: "root" - means solutions~~

II. Discriminant

If we had two real roots…

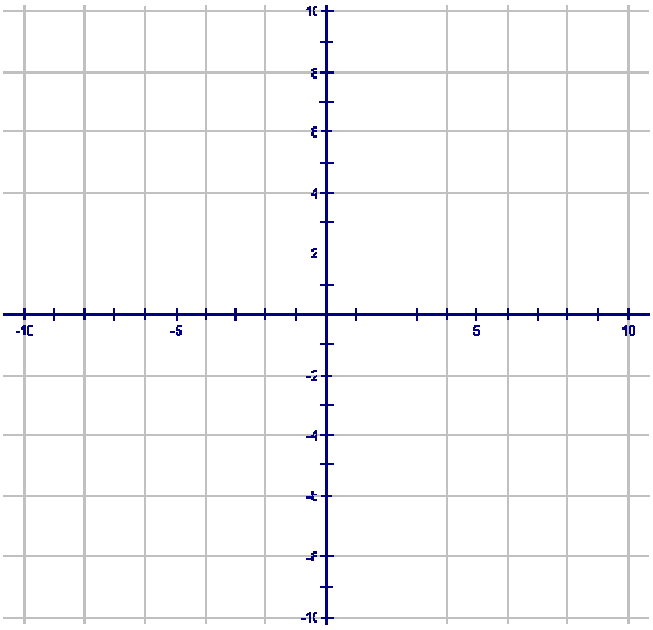
(look at example #1)



II. Discriminant

If we had one real root…

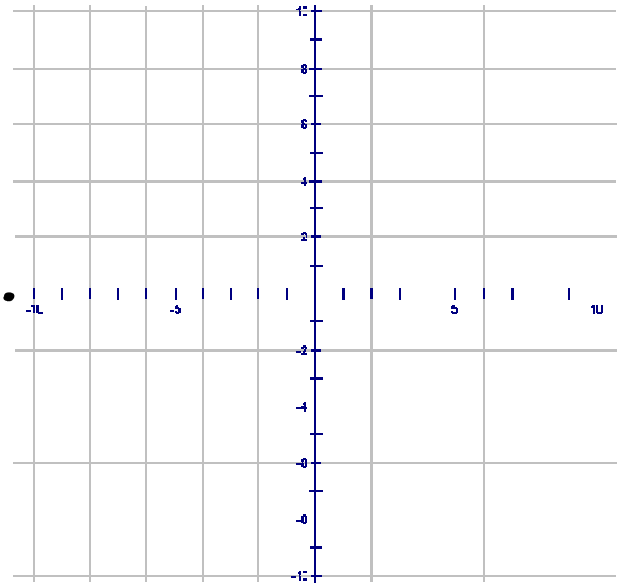
(look at Example #2)



II. Discriminant

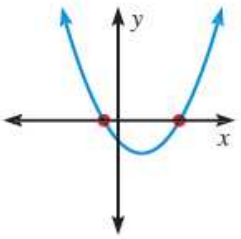
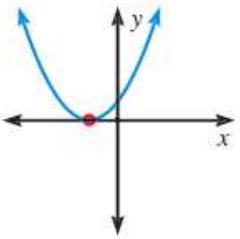
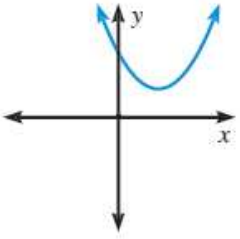
If we had two imaginary roots…

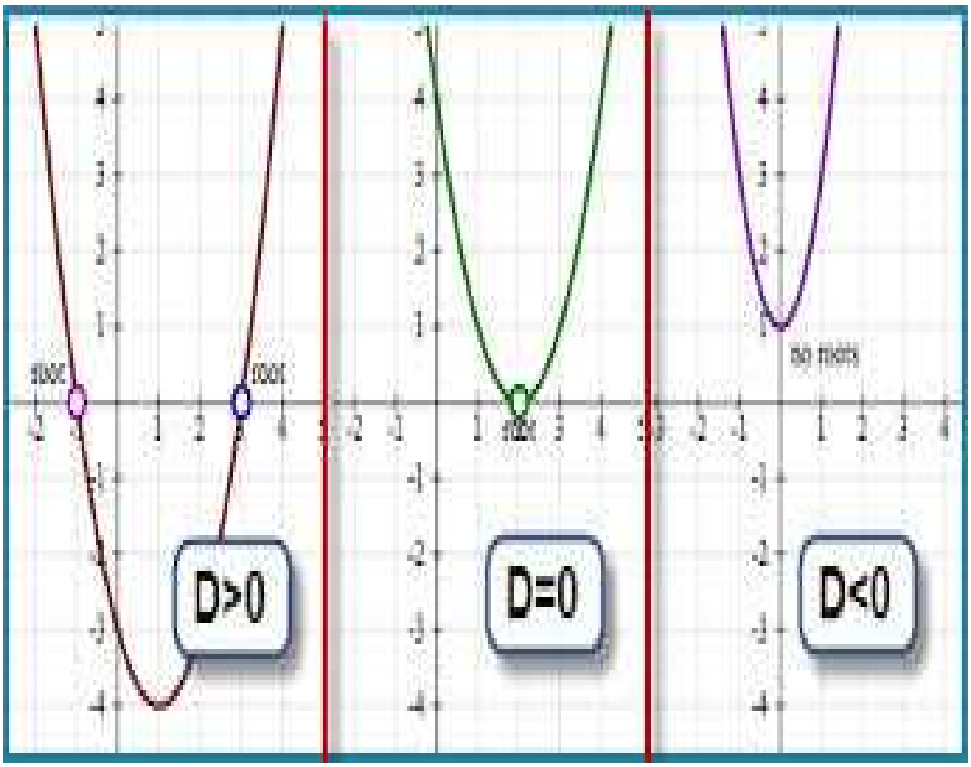
(look at Example #3)



KEY CONCEPT *For Your Notebook*

Using the Discriminant of $ax^2 + bx + c = 0$

Value of discriminant	$b^2 - 4ac > 0$	$b^2 - 4ac = 0$	$b^2 - 4ac < 0$
Number and type of solutions	Two real solutions	One real solution	Two imaginary solutions
Graph of $y = ax^2 + bx + c$	 Two x-intercepts	 One x-intercept	 No x-intercept



Warm Up

Find the discriminant of the quadratic equation and give the number and type of solutions of the equation. b^2-4ac

1) $8x^2=9x-11$

$8x^2-9x+11=0$

$(-9)^2-4(8)(11)$

$81-352$

-271

No real Roots

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

$4^2-4(2)(-4)$

$16+32$

$+$

2 real solutions

3) $7x^2-2x=5$

$7x^2-2x-5$

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

$4+140$

$+$

2 real solution

Let's take a break from the notes.....

Solving WS (Best Method)

Step 1: Look at the problem an choose the "best" method for solving.

Let's discuss

Step 2: Solve the equation using the methods discussed in class.

(10) $(x-2)(x+1)=4$

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

III. Imaginary Numbers

As we enter the land of Oz....

Let's use our imaginations..

$\sqrt{-1} = i$

$i^2 = \sqrt{-1}^2$

$i^2 = -1$

$i^3 = i^2 \cdot i^1 = -1i$ or $-i$

$-1 \cdot i$

$i^4 = i^2 \cdot i^2$

$i \cdot i$

$= -1 \cdot -1$

$= 1$

i^0	i^1	i^2	i^3	i^4	i^5	i^6	i^7	i^8
1	i	-1	$-i$	1	i	-1	$-i$	1

$i^2 \cdot i^3$

$-1 \cdot -i$

$$i^3 = i^2 \cdot i = -1 \cdot i = -i,$$

Examples: i^{27} $= -i$

$i^8 \cdot i^8 \cdot i^8 \cdot i^3$

$1 \cdot 1 \cdot 1 \; -i$

II. Solve.

Examples

$$x^2 + 1 = 0$$

II. Solve.

Examples

$$x^2+6x+18=0$$

ax^2+bx+c $\quad a=1 \quad b=6 \quad c=18$

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

$$x=\frac{-6\pm\sqrt{6^2-4(1)(18)}}{2(1)}$$

$$x=\frac{-6\pm\sqrt{36-72}}{2}$$

$$x=\frac{-6\pm\sqrt{-36}}{2} \quad \sqrt{-1}=i \quad \sqrt{36}=6$$

$$x=\frac{-6\pm 6i}{2}$$

$$x=-3\pm 3i$$

$$x=\frac{-6\pm 6i}{5}$$

II. Solve.

Examples

$$-3(x-4)^2 = 18$$

$\div -3 \quad \div -3$

$\sqrt{(x-4)^2} = \sqrt{-6}$

$x-4 = \pm\sqrt{-6}$ $\leftarrow \sqrt{-1}\sqrt{6}$

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

$+4$

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

II. Solve.

Examples

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

$$-6x^2+3x-1=0$$

$a=-6 \quad b=3 \quad c=-1$

$$x=\frac{-3\pm\sqrt{9-4(-6)(-1)}}{2(-6)}$$

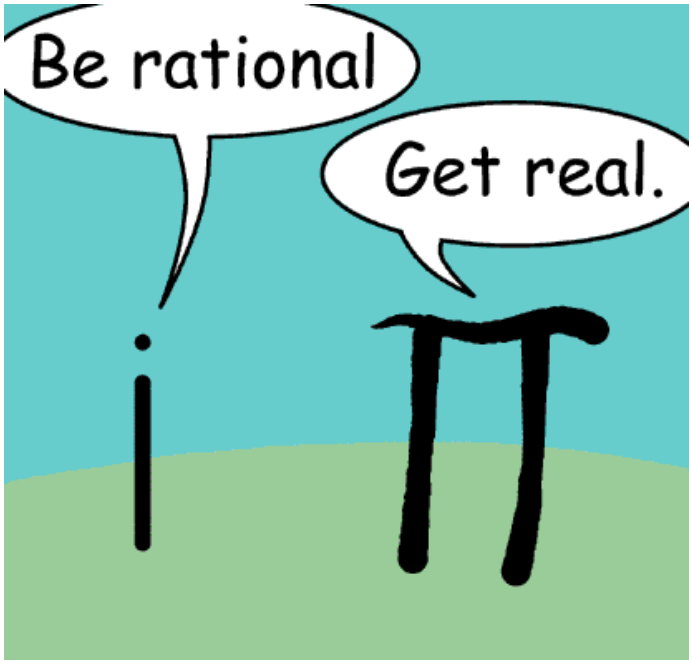
$$x=\frac{-3\pm\sqrt{9-24}}{-12}$$

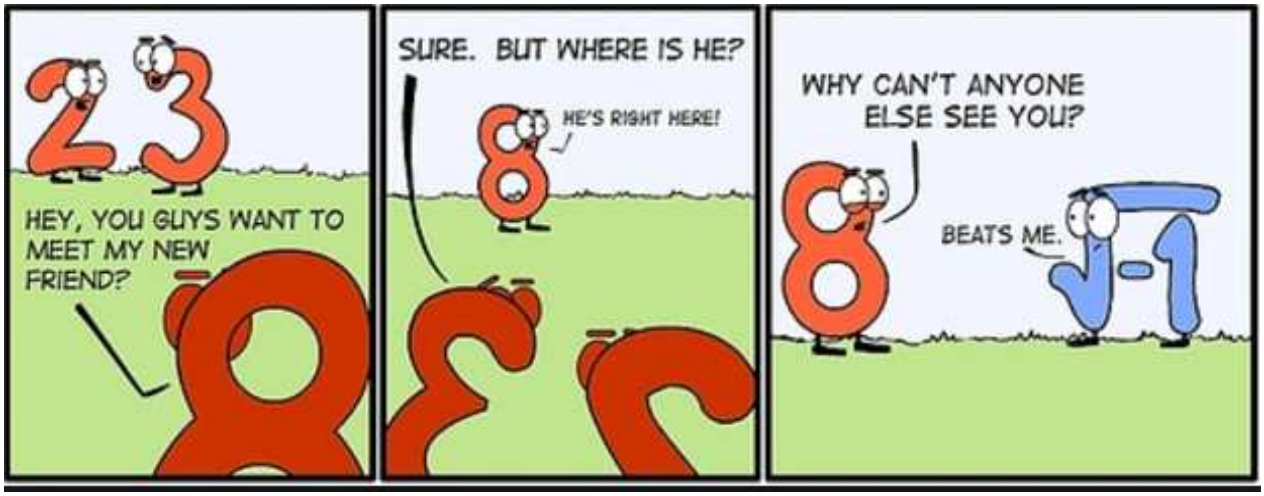
$$x=\frac{-3\pm\sqrt{-15}}{-12} \quad \sqrt{-1}\ \sqrt{15}$$

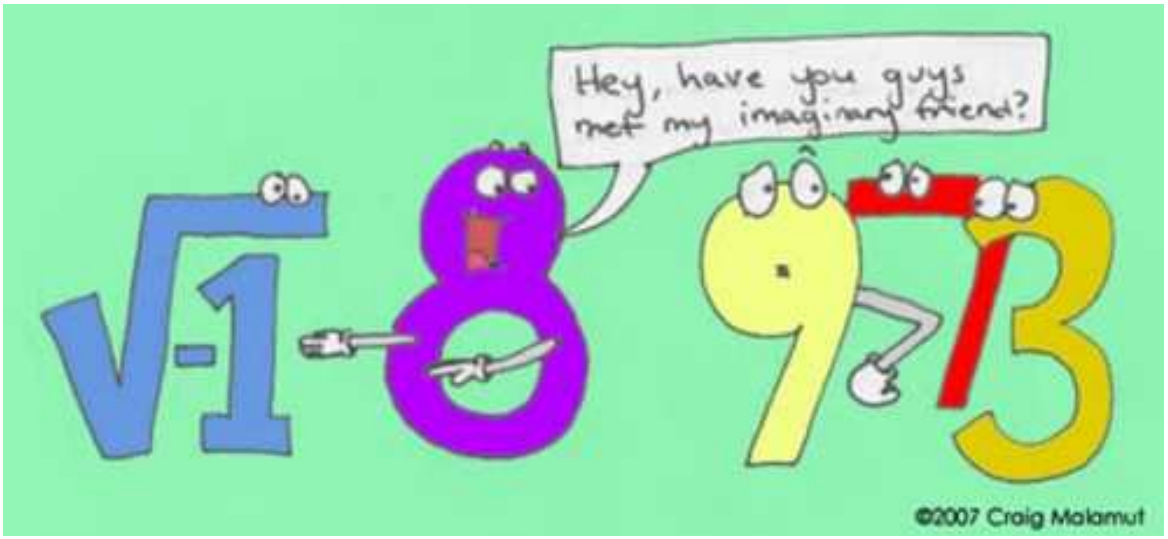
$$x=\frac{-3\pm i\sqrt{15}}{-12}$$

Placemat

Yellows ws


Be rational
Get real.
i
π


HEY, YOU GUYS WANT TO MEET MY NEW FRIEND?
SURE. BUT WHERE IS HE?
HE'S RIGHT HERE!
WHY CAN'T ANYONE ELSE SEE YOU?
BEATS ME.


Hey, have you guys met my imaginary friend?
©2007 Craig Malamut

III. Imaginary Numbers

$\sqrt{-5} = \sqrt{-1}\cdot\sqrt{5} = i\sqrt{5}$

$\sqrt{-\frac{1}{4}} = \sqrt{-1}\cdot\sqrt{\frac{1}{4}} = i\frac{1}{2}$ or $\frac{1}{2}i$

$\sqrt{-8} = \sqrt{-1}\sqrt{4}\cdot\sqrt{2}$

$i2\sqrt{2}$

or

$2i\sqrt{2}$

III. Imaginary Numbers

Real Numbers

$1, -3, 0, \pi, .5, -\frac{1}{98}$

Purely Imaginary Numbers

$i, -3i, i\sqrt{5}, \pi i$

Complex Numbers

$1+i, -3-2i, \pi+i$

$a+bi$ ← standard form

III. Imaginary Numbers

To add and subtract complex numbers…

Add or subtract the real parts…

…and then add or subtract the imaginary parts!

1.) $(2+3i)+(5-2i) = 7+i$

III. Imaginary Numbers

2.) $(17+4i)-(18-5i)=$ $-1+9i$

3.) $2(1+i)+(3+3i)=$ $5+5i$

$2+2i+3+3i$

4.) $(-4)+2(3-i)=$ $2-2i$

$-4+6-2i$

III. Imaginary Numbers

To multiply complex numbers…

FOIL!!!!!!!!!

1.) $(1+i)(2-3i) =$ $2-3i+2i-3i^2$ (-1)

$5-i$

2.) $(-3+i)(2-5i) =$ $-6+15i+2i-5i^2$ (-1)

$-1+17i$

3.) $(-4-i)(-4+i) =$

$16-4i+4i-i^2$

$-1(-1)$

17

Yellow ws

III. Imaginary Numbers

Every complex number has a fraternal twin.

$a+bi$ $a-bi$

1.) $4+3i$ $4-3i$

3.) $1-6i$ $1+6i$

2.) $-3-7i$ $-3+7i$

4.) $-2i$ $2i$

III. Imaginary Numbers

To divide complex numbers…

1.) $\dfrac{(7+3i)(2+i)}{(2-i)(2+i)}$

$\dfrac{14+7i+6i+3i^{2}}{4+2i-2i-i^{2}}$ $\quad (-1)$ $\quad -(-1)$

$\dfrac{11+13i}{5}$

III. Imaginary Numbers

2.) $\dfrac{4+7i}{-2-3i}$ $(-2+3i)$ $(-2+3i)$ $= \dfrac{(-8+12i-14i+21i^{2})}{4-6i+6i-9i^{2}}$ $\begin{matrix}(-1)\\(-1)\end{matrix}$

$= \dfrac{-29-2i}{13}$

3.) $\dfrac{1+2i}{4i}$ $(-4i)$ $(-4i)$ $= \dfrac{-4i-8i^{2}}{-16i^{2}}$ $\begin{matrix}(-1)\\(-1)\end{matrix}$ $= \dfrac{8-4i}{16}$

DLT

And the homework is....
Unit 2 Day 4/5

Solve using the Best Method ws-Quiz Friday and next Monday