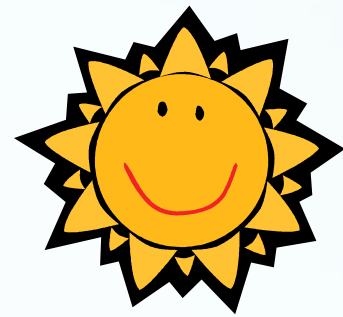# Unit 2 Day 8

## Quiz Day

# Warm Up

**Notes p.31**

10. Find the zeros of the following. Show all your work using the appropriate method.
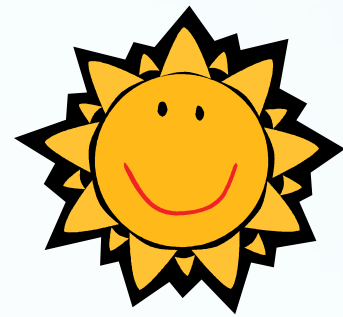
a. $x^2 - 9x + 12 = 0$

b. $x^2 - 16 = -4x$

c. $2x^2 + 8x = 13$

d. $x^2 + 3x = 28$

e. Show your work in the boxes to find the requested values of $y = 2x^2 - 5x - 3$ algebraically.

# Warm Up Answers

**Notes p.31**

10. Find the zeros of the following. Show all your work using the appropriate method.

a. $x^2 - 9x + 12 = 0$ $\quad \dfrac{9 \pm \sqrt{33}}{2}$

b. $x^2 - 16 = -4x$ $\quad -2 \pm 2\sqrt{5}$

c. $2x^2 + 8x = 13$ $\quad \dfrac{-4 \pm \sqrt{42}}{2}$

d. $x^2 + 3x = 28$ $\quad 4, -7$

**Remember to**
*get the equation = 0 first!
*be careful with signs!
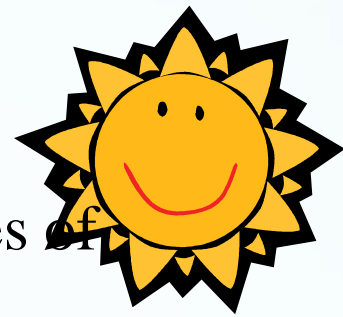*simplify whenever possible!
   -> simplify the radical
   -> see if there's a GCF that you can pull out of all 3 numbers outside the radical!

**Problem d could have been solved by factoring. Check if an equation is factorable 1st since that's easier and has less room for little errors than Quadratic Formula!** ☺

3

# Warm Up

e. Show your work in the boxes to find the requested values of
$y = 2x^2 - 5x - 3$ algebraically.

| Solve by factoring $(2x+1)(x-3) = 0$ $x = -\dfrac{1}{2}, 3$ | x-int **(-1/2, 0)** **(3, 0)** | Vertex **(1.25, -6.125)** x = -1/2 + 3 ⎯⎯⎯⎯ 2 x = 1.25 y= 2(1.25)² -5(1.25)-3 y= -6.125 |
|---|---|---|
| | y-int **(0, -3)** | Max or min? **Min** |
| | Axis of symmetry **x = 1.25** | |
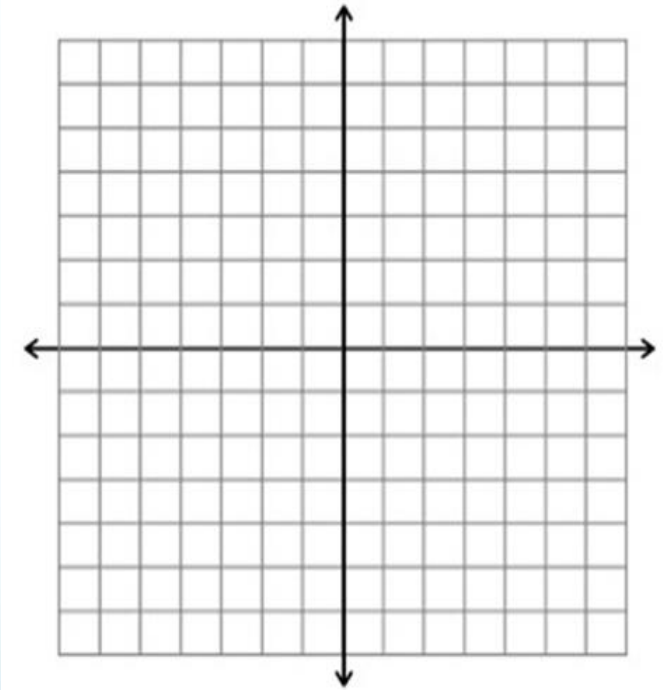
4

# Warm Up

e. Show your work in the boxes to find the requested values of $y = 2x^2 - 5x - 3$ algebraically.

**Solve by factoring**

$y = 2x^2 - 5x - 3$

$-6 \cdot 1 = -6 = a \cdot c$

$-6 + 1 = -5 = b$

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

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

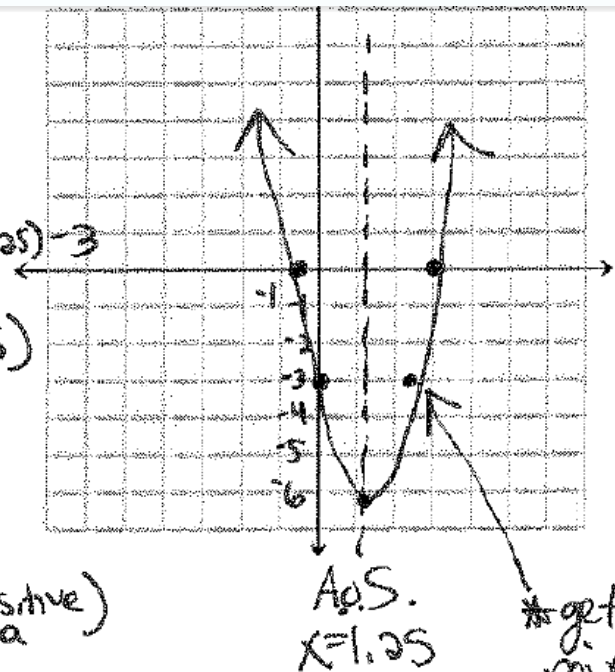$y = (2x+1)(x-3)$

$2x+1 = 0 \quad x-3 = 0$

$2x = -1$

$\boxed{x = -\frac{1}{2}} \qquad \boxed{x = 3}$

**x-intercepts**

$(3, 0)$

$(-\frac{1}{2}, 0)$

※ write as coordinate pair!

**y-intercepts**

$y = 2(0)^2 - 5(0) - 3$

$y = -3$

$(0, -3)$

**Vertex**

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

$x = 1.25$

$y = 2(1.25)^2 - 5(1.25) - 3$

$= -6.125$

$(1.25, -6.125)$

**Maximum or minimum?**

Smile because

$a = 2$ so

$a > 0$ (positive)

minimum

**Axis of symmetry**

$x = 1.25$

(use x-value from vertex!)

↑ Remember to write "x=" because AoS is <u>a line</u>

AoS. $x = 1.25$

※ get 5th point by mirroring y-intercept over the AoS.

# Homework Answers p. 10 ODD

1) $x = \left\{ \dfrac{5}{4}, -4 \right\}$

3) $x = \dfrac{3 \pm \sqrt{21}}{2}$

5) $x = \dfrac{-1 \pm \sqrt{5}}{2}$

7) $x = \left\{ \dfrac{5}{4}, -3 \right\}$

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

11) $x = \dfrac{-3 \pm \sqrt{11}\,i}{4}$

13) $x = \dfrac{5 \pm \sqrt{37}}{3}$

You'll learn more about problems with imaginary roots (with – under radical) in Honors Math 3.

# Homework Answers p. 11-12 ODDS

Part 1- **First:** The formula to calculate the discriminant is **$b^2 - 4ac$**

1) 76
3) 96
5) 17

Part 2- **First:** Explain the difference between real and imaginary solutions
**An imaginary number is a number that can be written as a real number multiplied by the imaginary unit i, which is defined by its property i² = −1  or $i = \sqrt{-1}$ .**

7)  -63; 2 imaginary solutions
9)  0; 1 real rational solution
11)  -224; 2 imaginary solutions
13) -80; 2 imaginary solutions

# Homework Answers p. 11-12 ODDS

Part 3- **First:** Explain the difference between rational and irrational solutions. A Rational Number can be written as a Ratio of two integers (a simple fraction). An Irrational Number is a real number that cannot be written as a simple fraction.

15) 121; 2 rational real solutions

17) 64; 2 rational real solutions

19) -359; 2 imaginary solutions

23)  Answers will vary.
Example: $-3x^2+2n-1=0$, because the discriminant is -8 and therefore has 2 imaginary solutions.

25) Farmer Smith built a rectangular pen for his animals using 14 meters of fence. He used part of one side of his barn as one length of the pen. He maximized the area for the 14 meters of fence.

Farmer Jones built a rectangular pen for her animals using 18 meters of fence. She used part of one side of her barn as one length of the pen. Her pen had a length that was 2 meters greater than the length of Farmer Smith's pen. Her pen had a width that was 1 meter greater than the width of Farmer Smith's pen.

How much larger is Farmer Jones' rectangular pen than Farmer Smith's?

## Farmer Smith

$x(14-2x) = 0$
$14x - 2x^2 = 0 \rightarrow$ Find the max area

$(3.5, 24.5)$
$x$ , max area

width = 3.5
length = 7
Area = 24.5

Add 1!
Add 2!

## Farmer Jones

width = 4.5
length = 9
Area = 40.5

Farmer Jones' pen is 16 m$^2$ larger than Famer Smith's pen.

# Tonight's Homework
Packet p. 10-12 EVENS only

# Cumulative Review Of Homework's AND Unit Material

Please get a whiteboard, marker, eraser, pencil and paper!

# **Whiteboard Review**

1. Solve using the quadratic formula. Show work!

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

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

# **Whiteboard Review**

2. What is the vertex of this function?

$$y = x^2 - 4x - 77$$

**(2, -81)**

# Whiteboard Review

3. Given the height of a paper airplane that is launched from the ground is represented by

$$h(p) = -12p^2 + 36p$$

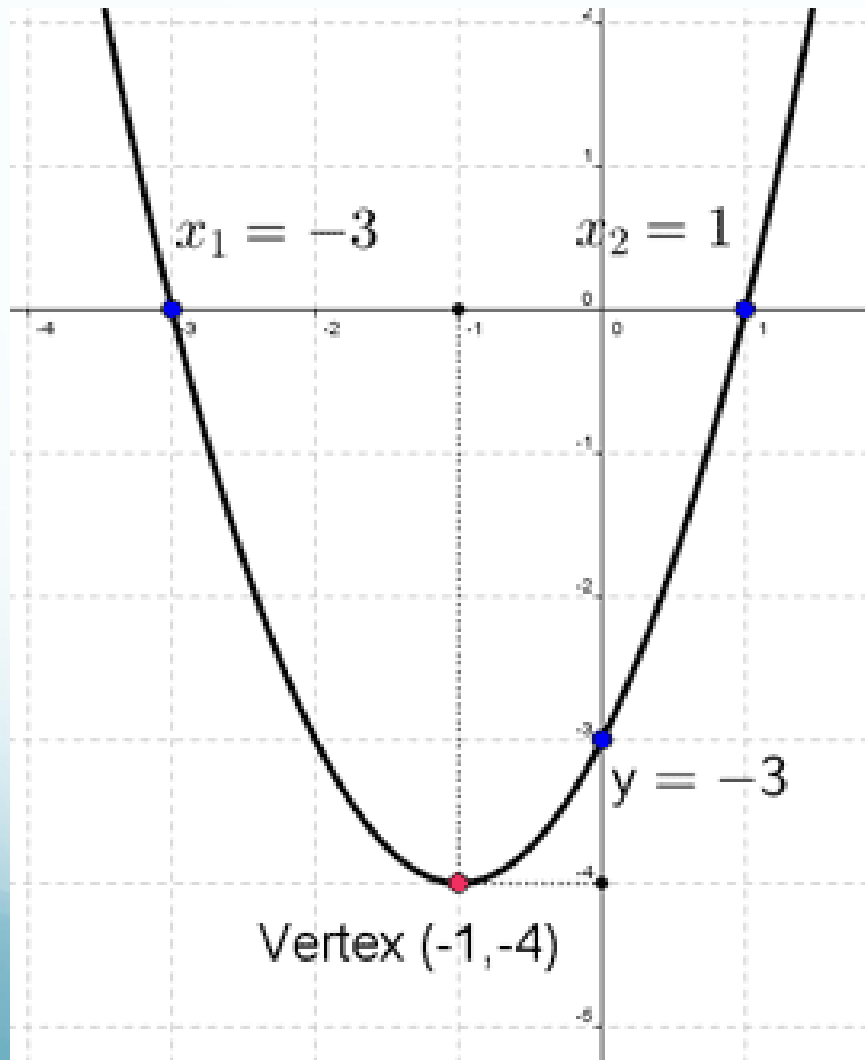What is the maximum height of the plane?

**Maximum height is 27 feet**

How many seconds does it take for the plane to hit the ground after take off?

**The plane hits the ground after approximately 3 sec**

# Whiteboard Review

4. Write an equation for the quadratic.



$x_1 = -3$    $x_2 = 1$

$y = -3$

Vertex (-1,-4)

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

# Whiteboard Review

5. Write a quadratic equation based on the price of a stock as it fluctuates in 1 hour.

| Time (minutes) | Stock ($) |
|---|---|
| 0 | 120 |
| 10 | 100 |
| 20 | 83 |
| 30 | 66 |
| 40 | 55 |
| 50 | 62 |
| 60 | 88 |

Round to the nearest thousandth.

$y = .043x^2 - 3.3x + 124.976$

Remember to enter Time in L1, Stock in L2.
Then do Stat, Calc, QuadReg.

# **Whiteboard Review**

6. Solve by factoring.

$$3x^2 + 16x - 12 = 0$$

**x = 2/3 AND  -6**

# **Whiteboard Review**

7. What is the axis of symmetry?

$$y = x^2 - 9x - 52$$

$$x = \frac{9}{2}$$

# QUIZ TIME!!

Start Quiz :

End Quiz:

Homework Tonight ~
Packet Page 10 – 12 Evens Only