

Day 8: Review and Quiz

Warm-Up:

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

a.  $x^2 - 9x + 12 = 0$

$\begin{array}{r} \underline{\quad} = 12 \\ \underline{+} \quad = -9 \end{array}$   
 not factorable  
 b/c not possible

\*get zeros on calculator  
 and Trace 2: zero  
 + pick left + right bounds  
 $x = 1.62, 7.37$

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

$x^2 + 4x - 16 = 0$

$\begin{array}{r} \underline{\quad} = -16 \\ \underline{+} \quad = 4 \end{array}$   
 not possible so  
 not factorable

\*get zeros on calculator  
 $x = -6.47, 2.47$

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

$2x^2 + 8x - 13 = 0$

$\begin{array}{r} \underline{\quad} = -26 = a \cdot c \\ \underline{+} \quad = 8 = b \end{array}$

\*get zeros on calculator  
 $x = -5.24, 1.24$

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

$x^2 + 3x - 28 = 0$

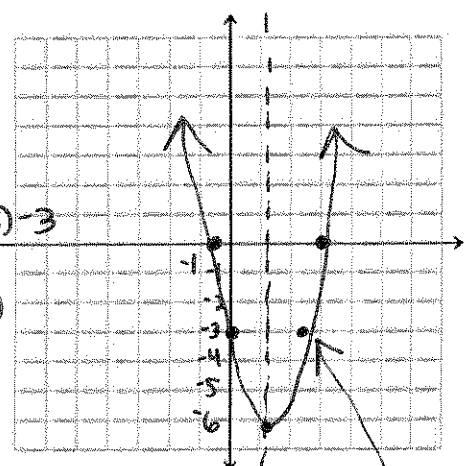
$\begin{array}{r} \underline{\quad} = -28 = a \cdot c \\ \underline{+} \quad = 3 = b \end{array}$

$(x+7)(x-4) = 0$   
 $x+7=0 \quad x-4=0$

$x = -7, 4$

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

Solve by factoring $y = (2x^2 - 5x - 3)$ $\underline{-6} \cdot \underline{1} = -6 = a \cdot c$ $\underline{-6} + \underline{1} = -5 = b$ $y = 2x^2 - 6x + 1x - 3$ $y = 2x(x-3) + 1(x-3)$ $y = (2x+1)(x-3)$ $2x+1=0 \quad x-3=0$ $2x=-1 \quad \boxed{x=3}$ <span style="border: 1px solid black; padding: 2px;"><math>x = -\frac{1}{2}</math></span>	x-intercepts $(3, 0)$ $(-\frac{1}{2}, 0)$ & write as coordinate pair! y-intercepts $y = 2(0)^2 - 5(0) - 3$ $y = -3$ $(0, -3)$ Axis of symmetry $x = 1.25$ (use x-value from vertex!)	Vertex $x = 3 + \frac{-1}{2}$ $x = 1.25$ $y = 2(1.25)^2 - 5(1.25) - 3$ $y = -6.125$ $(1.25, -6.125)$ Maximum or minimum? ↑ Smile because $a = 2$ so $a > 0$ (positive a) Minimum
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\*get 5th point by mirroring y-intercept over the AoS.

↑ Remember to write "x=" because AoS is a line

## Whiteboard Review

1. Solve using the quadratic formula.

Show work!

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

$$\rightarrow x^2 - 4x - 8 = 0 \quad \text{set } = 0 \text{ first}$$

$$a=1 \quad b=-4 \quad c=-8$$

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

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

$$x = \frac{4 \pm \sqrt{48}}{2} = \frac{4 \pm \sqrt{16 \cdot 3}}{2}$$

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

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

then get GCF of all 3 coefficient values (cover up radical + get GCF of those 3) #s

4, 4, and 2 all have a GCF of 2

## Whiteboard Review

2. What is the vertex of this function?

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

$$y = (x - 11)(x + 7)$$

$$-11 \cdot 7 = -77$$

$$-11 + 7 = -4$$

Fix

~~(2, -81)~~

$$(2, -81)$$

$$x - 11 = 0 \quad x + 7 = 0$$

$$x = 11 \quad x = -7$$

x-intercepts (11, 0) (-7, 0)

$$x \text{ of vertex} = \frac{11 + (-7)}{2} = \frac{4}{2} = 2$$

$$y = (2)^2 - 4(2) - 77$$

$$y = -81$$

### Whiteboard Review

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

$$h(p) = -12p^2 + 36p = -12p(p - 3)$$

What is the maximum height of the plane and after how many seconds does it hit the ground?

$$\begin{aligned} -12p &= 0 & p-3 &= 0 \\ p &= 0 & p &= 3 \end{aligned}$$

zeros  $(0,0)$   $(3,0)$

Maximum height is 27 feet  
and it hits the ground after 3 seconds

$$x \text{ of vertex} = \frac{0+3}{2} = \frac{3}{2} \text{ or } 1.5$$

$$y = -12\left(\frac{3}{2}\right)^2 + 36\left(\frac{3}{2}\right)$$

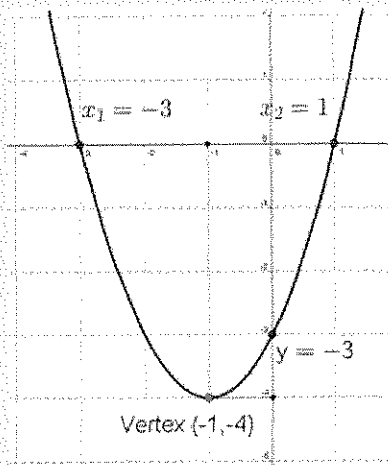
$$y = 27$$

vertex  $(\frac{3}{2}, 27)$

from vertex  
from further zero x-value

### Whiteboard Review

4. Write an equation for the quadratic.



zeros  $(-3,0)$   $(1,0)$

$$y = a(x - (-3))(x - 1)$$

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

$$y = a(x^2 + 2x - 3)$$

$$-4 = a((-1)^2 + 2(-1) - 3)$$

$$-4 = a(-4)$$

$$\frac{-4}{-4} = \frac{-4a}{-4}$$

$$1 = a$$

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

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

## 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.

Put time in L1  
Put Stock in L2

} Press Stat  
1: Edit  
to get here

~~$y = 0.04x^2 - 3.3x + 125$~~

$y = 0.043 - 3.3x + 124.976$

12

## Whiteboard Review

6. Solve by factoring.

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

$\frac{18 \cdot -2}{18 + -2} = \frac{-36}{16} = a \cdot c$   
 $\frac{18}{18} + \frac{-2}{-2} = 16 = b$

$x = 2/3 \text{ and } -6$

$3x^2 + 18x - 2x - 12 = 0$   
 $3x(x+6) - 2(x+6) = 0$   
 $(3x-2)(x+6) = 0$   
 $3x-2=0 \quad x+6=0$   
 $3x=2 \quad x=-6$

$x = 2/3$

$x = -6$

13

## Whiteboard Review

7. What is the axis of symmetry?

$$y = x^2 - 9x - 52 \quad \begin{array}{l} -13 \cdot 4 = -52 \\ -13 + 4 = -9 \end{array}$$

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

$$y = (x - 13)(x + 4)$$

zeros (13, 0) (-4, 0)

$$x \text{ of vertex} = \frac{13 + (-4)}{2} = \frac{9}{2}$$

Remember...

axis of symmetry is a line so you **MUST** write "x=" on front!



# QUIZ TIME