Starter

Grab the worksheet on the desk next to mine, pg. 52, and work on #20-26. We'll finish up 2.8 Lining Up Quadratics shortly.

Vertex Form: $f(x) = a(x-h)^2 + k$ (a: stretch) vertex: (h,k)

(21) $y = -3(x+6)^2 + 3$

vertex: $(-6,3)$

x-int:

y-int: $(0,-105)$

stretch: -3

y-int:

$y = -3(0+6)^2 + 3$

$= -3(6)^2 + 3$

$= -3(36) + 3$

$= -108 + 3$

$= -105$

$(0,-105)$

x-int:

$0 = -3(x+6)^2 + 3$

$-3 \qquad -3$

$\frac{-3}{-3} = \frac{-3(x+6)^2}{-3}$

$\sqrt{1} = \sqrt{(x+6)^2}$

$\pm 1 = x+6$

$-6 \qquad -6$

$-6 \pm 1 = x$

$-6+1$ and $-6-1$

$-5 \qquad -7$

$(-5,0) \qquad (-7,0)$

We are turning in:

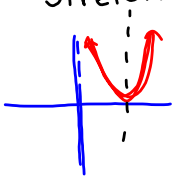
PAGE 52

2.8 (I will check only pages 50-51 for credit)

pg 51

(11) $y = 4(x-2)(x+6)$

Vertex:
x-int: (2,0) & (-6,0)
y-int: (0,-48)
stretch: 4



x-int:

$0 = 4(x-2)(x+6)$

$x-2=0$ $\quad x+6=0$
$+2\ +2$ $\quad -6\ -6$
$x=2$ $\quad x=-6$

Vertex: (-2,-64)

$x = \frac{2+-6}{2} =$

$\frac{-4}{2} = -2$

$y = 4(-2-2)(-2+6)$
$= 4(-4)(4)$
$= -64$

y-int:

$y = 4(0-2)(0+6)$
$= 4(-2)(6)$
$= -48$ (0,-48)

(16) $y = \frac{3}{5}(x-25)(x-9)$

Vertex: (-17,)
x-int: (25,0) & (9,0)
y-int: (0,135)
stretch: 3/5
Vertex: (-17,)

$x = \frac{-25+-9}{2} = \frac{-34}{2} = -17$

$y = \frac{3}{5}(-17+25)(-17+9)$

$y = \frac{3}{5}(-42)(-26)$

$y = 655.2$

$\rightarrow \frac{3}{5}(-25)(-9) = y$

$3 \cdot -5 \cdot -9 = y$

$135 = y$

120
15

(12) $y = -3(x+2)(x-6)$

V: (2,48)
x-int: (-2,0) (6,0)
y-int: (0,36)
St: -3

y-int:

$y = -3(2)(-6)$

$y = -6 \cdot -6$

$y = 36$

Vertex: (2,48)

$x = \frac{-2+6}{2} = \frac{4}{2} = 2$

$y = -3(2+2)(2-6)$
$y = -3(4)(-4)$
$y = -48$

p51 $(10x-7)^2$

	10x	-7
10x	$100x^2$	-70x
-7	-70x	+49

2.8 Lining Up Quadratics

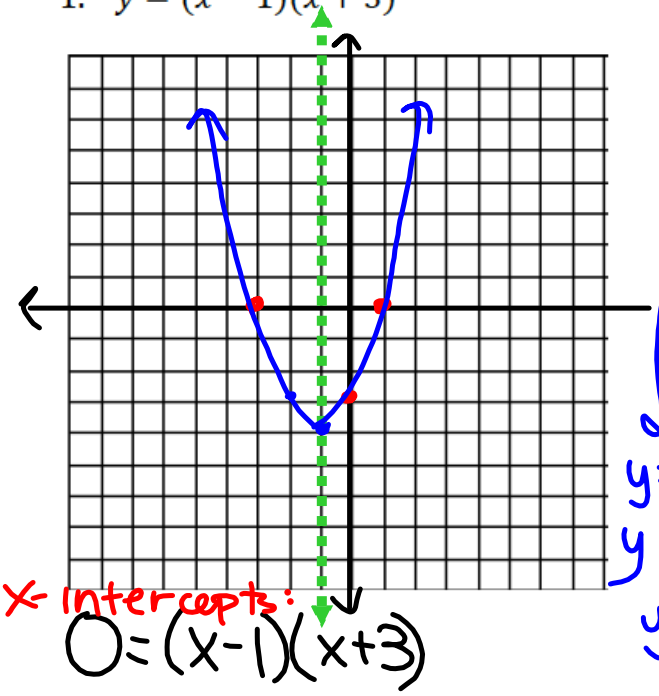
A Practice Understanding Task

Graph each function and find the vertex, the *y*-intercept and the *x*-intercepts. Be sure to properly write the intercepts as points.

factored form: $y = (x-d)(x-e)$

to find x-intercepts make y=0 & solve for x.

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



Line of Symmetry $x=-1$

Vertex $(-1,-4)$

x-intercepts $(1,0)$ $(-3,0)$

y-intercept $(0,-3)$

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

$y = -2 \cdot 2$

$y = -4$

to find y-intercepts: make x=0 & solve for y

x-intercepts:

$0 = (x-1)(x+3)$

$x-1=0$ and $x+3=0$

$+1 \quad +1$ $\quad -3 \quad -3$

$x = 1$ $\quad x = -3$

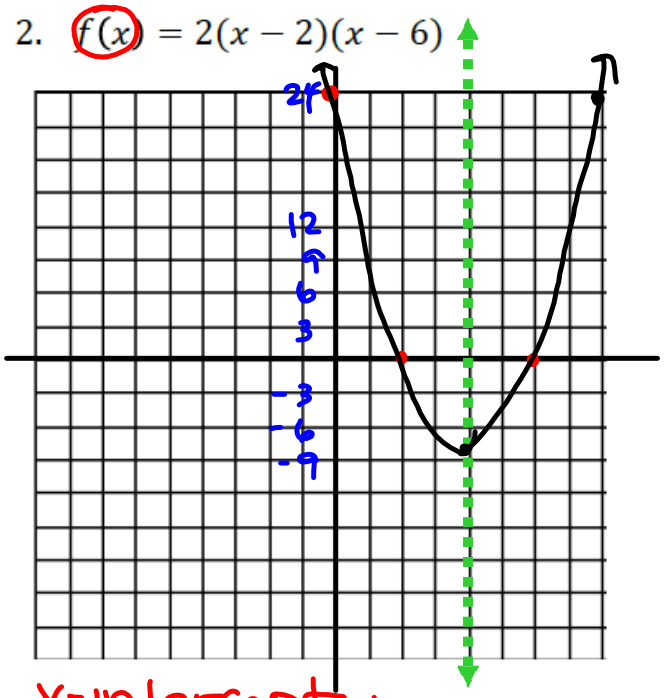
y-intercepts:

$y = (0-1)(0+3)$

$y = -1 \cdot 3$

$y = -3$

2. $f(x) = 2(x-2)(x-6)$



Line of Symmetry $x = 4$

Vertex $(4, -8)$

x-intercepts $(2,0)$ $(6,0)$

y-intercept $(0,24)$

y-intercept:

$f(x) = 2(0-2)(0-6)$

$= 2(-2)(-6)$

$= 24$

vertex

$f(4) = 2(4-2)(4-6)$

$= 2(2)(-2)$

$= -8$

x-intercepts:

$\frac{0}{2} = \frac{2(x-2)(x-6)}{2}$

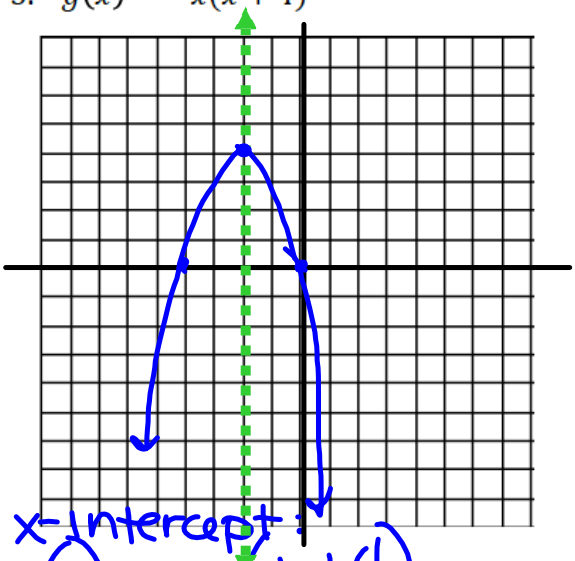
$0 = (x-2)(x-6)$

$x-2=0$ $\quad$ $x-6=0$

$+2 \quad +2$ $\quad$ $+6 \quad +6$

$x = 2$ $\quad$ $x = 6$

3. $g(x) = -x(x+4)$



Line of Symmetry $x = -2$

Vertex $(-2, 4)$

x-intercepts $(-4, 0)$ $(0, 0)$

y-intercept $(0, 0)$

$f(-2) = -(-2)(-2+4)$

$= 2 \cdot 2$

$= 4$

x-intercepts:

$0 = -x(x+4)$

$x+4=0$ $\quad -x=0$

$-4 \quad -4 \quad -1 \quad -1$

$x = -4 \quad x = 0$

HW: #4 on pg 47

#11-19 on pg. 51

4. Based on these examples, how can you use a quadratic function in factored form to:
   a. Find the line of symmetry of the parabola?

   b. Find the vertex of the parabola?

   c. Find the x-intercepts of the parabola?

   d. Find the y-intercept of the parabola?

   e. Find the vertical stretch?

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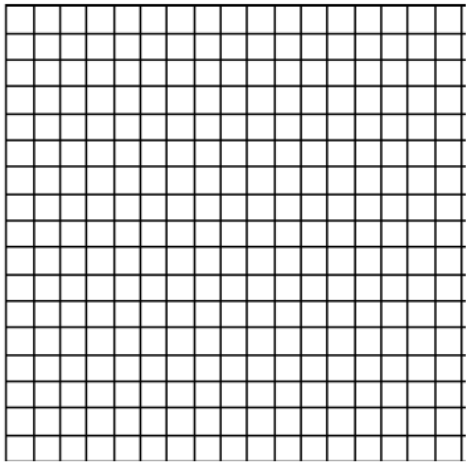
5. Choose any two **linear** functions and write them in the form: $f(x) = m(x - c)$, where m is the slope of the line. Graph the two functions.

Linear function 1:

Linear function 2:

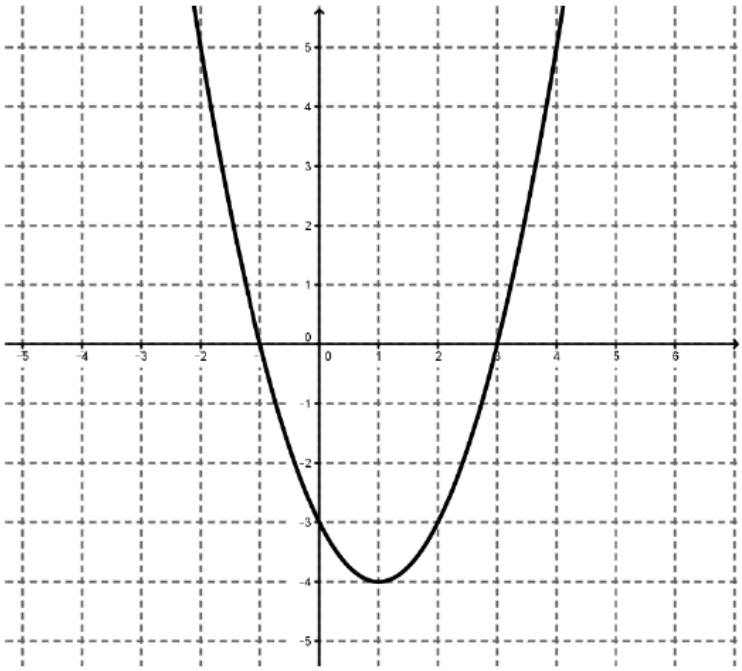


6. On the same graph as #5, graph the function *P(x)* that is the product of the two linear functions that you have chosen. What shape is created?

7. Describe the relationship between *x*-intercepts of the linear functions and the *x*-intercepts of the function *P(x)*. Why does this relationship exist?

8. Describe the relationship between y-intercepts of the linear functions and the y-intercepts of the function $P(x)$. Why does this relationship exist?

9. Given the parabola to the right, sketch two lines that could represent its linear factors.



10. Write an equation for each of these two lines.

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11. How did you use the x and y intercepts of the parabola to select the two lines?

12. Are these the only two lines that could represent the linear factors of the parabola? If so, explain why. If not, describe the other possible lines.

13. Use your two lines to write the equation of the parabola. Is this the only possible equation of the parabola?

Homework

Finish 2.8 "Ready, Set, Go"

Mar 28-9:36 AM