

READ pp. 27-32, 36

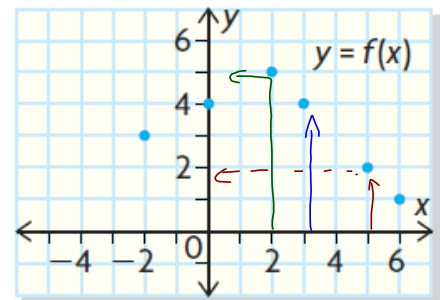
then complete: pp. 32-34 # 2, 4, 6, 9, 10a(vi), 11a(vi), 12

b⁻
c

12c

6. The graph of $y = f(x)$ is shown at the right.

- a) State the domain and range of f .
- b) Evaluate.
 - i) $f(3)$ ii) $f(5)$ iii) $f(5 - 3)$ iv) $f(5) - f(3)$
- c) In part (b), why is the value in (iv) not the same as that in (iii)?
- d) $f(2) = 5$. What is the corresponding ordered pair? What does 2 represent? What does $f(2)$ represent?



$x=3?$

$$f(3) = 4 \quad \text{ii) } f(5) = 2 \quad \text{iii) } f(5-3) = f(2) = 5 \quad \text{iv) } f(5) - f(3) = 2 - 4 = -2$$

9. Evaluate each function for the given x -values.

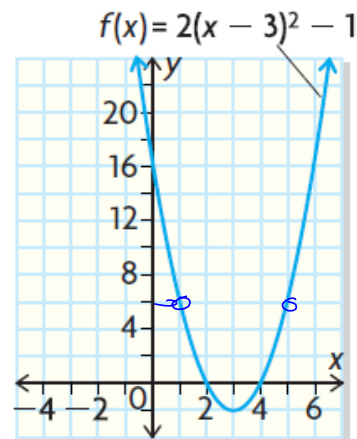
- a) $f(x) = 9x + 1; x = 0, x = 2$
- b) $f(x) = -2x - 3; x = -1, x = 3$
- c) $f(x) = 2x^2 + 5; x = 2, x = 3$
- d) $f(x) = 3x^2 - 4; x = 0, x = 4$

c) $f(x) = 2x^2 + 5$

$$f(2) = 2(2)^2 + 5 = 2(4) + 5 = 8 + 5 = 13$$

$$f(3) = 2(3)^2 + 5 = 2(9) + 5 = 18 + 5 = 23$$

12. The graph shows $f(x) = 2(x - 3)^2 - 1$.
- Evaluate $f(0)$.
 - What does $f(0)$ represent on the graph of f ?
 - If $f(x) = 6$, determine possible values of x .
 - Does $f(3) = 4$ for this function? Explain.



$$\begin{aligned}
 \text{a) } f(0) &= 2(0-3)^2 - 1 \\
 &= 2(-3)^2 - 1 \\
 &= 2(9) - 1 \\
 &= 18 - 1 \\
 &= 17
 \end{aligned}$$

b) the y-intercept

$$\begin{aligned}
 \text{c) } f(x) &= 6 \\
 6 &= 2(x-3)^2 - 1 \\
 0 &= 2(x^2 - 6x + 9) - 1 - 6 \\
 &= 2x^2 - 12x + 18 - 7 \\
 0 &= 2x^2 - 12x + 11 \\
 0 &= ax^2 + bx + c \\
 a &= 2 \quad b = -12 \quad c = 11
 \end{aligned}$$

$$\begin{aligned}
 x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\
 &= \frac{-(-12) \pm \sqrt{(-12)^2 - 4(2)(11)}}{2(2)} \\
 &= \frac{12 \pm \sqrt{144 - 88}}{4}
 \end{aligned}$$

Today's Learning Goal(s):

By the end of the class, I will be able to:

Use DESMOS File:
3M 1.4 Exploring Transformations

- Identify the difference between a horizontal and vertical transformation.
- Find the vertex given: $f(x) = ax^2$; or $f(x) = (x - h)^2$; or $f(x) = x^2 + k$

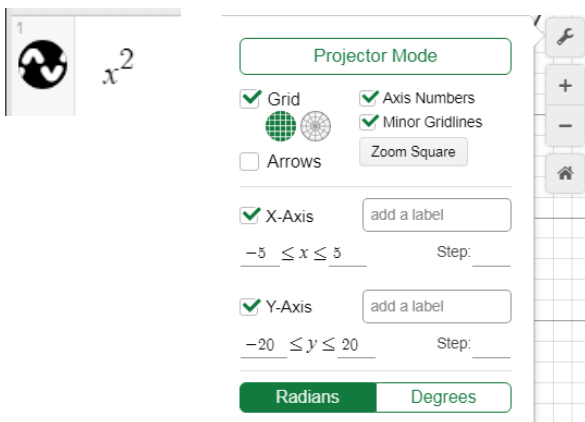
MCF 3MI

1.4 Exploring Transformations of Quadratic Functions

$$f(x) = a(x - h)^2 + k$$

Date: _____
(Every lesson)

Complete the handout using DESMOS (on your Chromebooks)



a -- complete p. 39 E,F

h -- complete p. 39 C,D

k -- complete p. 38 A,B

1.4 Exploring Transformations of Quadratic Functions-s20-p

February 14, 2020

- Learning Goal(s): a) Identify the difference between a horizontal and vertical transformation.
 b) Find the vertex given: $f(x) = ax^2$; or $f(x) = (x-h)^2$; or $f(x) = x^2 + k$

MCF 3MI

1.4 Exploring Transformations of Quadratic Functions

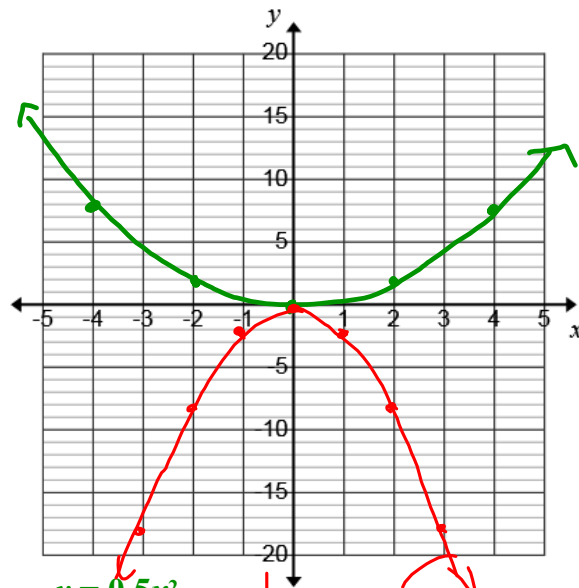
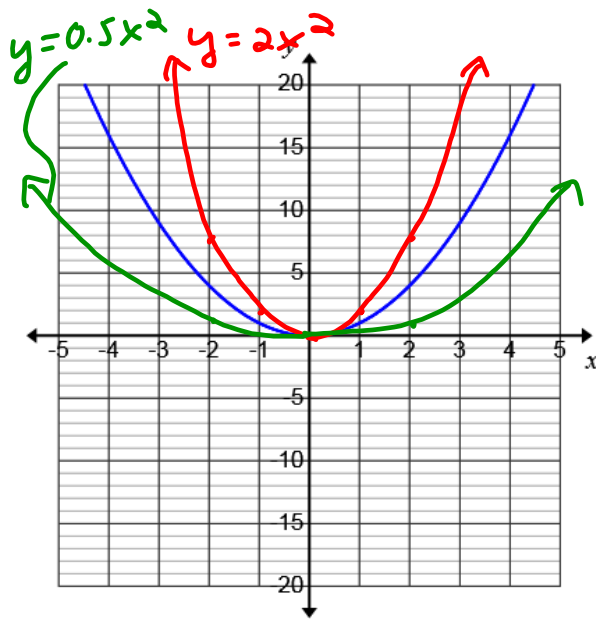
$$f(x) = a(x-h)^2 + k$$

Date: Feb 14/20

p.39 E,F: Complete the following table using DESMOS on your chromebooks (or prior knowledge of transformations)

Function	value of a in $f(x) = ax^2$	direction of opening	vertex	Axis of symmetry	Congruent to $f(x) = x^2$
(a) $f(x) = x^2$	1	up	(0,0)	$x=0$	Yes
(b) $f(x) = 2x^2$	2	up	(0,0)	$x=0$	No (thinner)
(c) $f(x) = 0.5x^2$	0.5	up	(0,0)	$x=0$	No (wider)
(d) $f(x) = -2x^2$	-2	down	(0,0)	$x=0$	No (thinner)
(e) $f(x) = -0.5x^2$	-0.5	downwards	(0,0)	$x=0$	No (wider)

Sketch and label at least 2 of the above functions. $f(x) = x^2$ is shown. (c & d are good choices)



MG $y = x^2$

OVER	UP	$a = 1$
1	1	
2	4	
3	9	
4	16	

$y = 0.5x^2$
or $y = \frac{1}{2}x^2$

MG

OVER	UP	$a = \frac{1}{2}$
1	1	$\rightarrow \frac{1}{2}$
2	4	$\rightarrow 2$
3	9	$\rightarrow \frac{9}{2}$
4	16	$\rightarrow 8$

MG

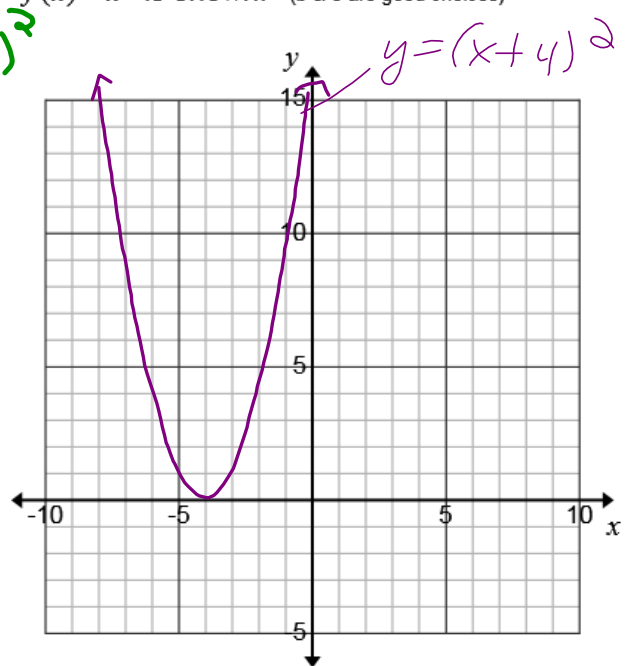
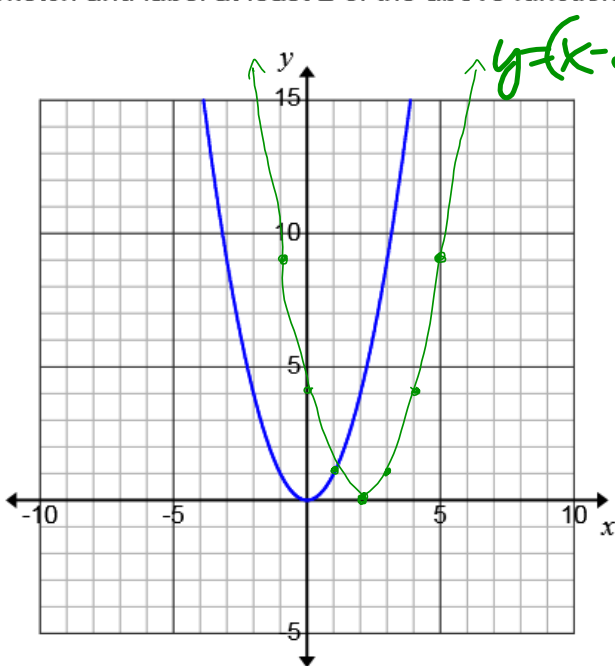
OVER	UP	$a = -2$
1	1	$\rightarrow -2$
2	4	$\rightarrow -8$
3	9	$\rightarrow -18$
4	16	$\rightarrow -32$

p.39 C,D: Complete the following table using DESMOS on your chromebooks (or prior knowledge of transformations)

Function	value of h in $f(x) = (x-h)^2$	direction of opening	vertex	Axis of symmetry	Congruent to $f(x) = x^2$
(a) $f(x) = x^2$	$h = 0$	up	$(0, 0)$	$X = 0$	Yes
(b) $f(x) = (x-2)^2$	$h = 2$	up	$(2, 0)$	$X = 2$	Yes
(c) $f(x) = (x-4)^2$	$h = 4$	up	$(4, 0)$	$X = 4$	Yes
(d) $f(x) = (x+2)^2$	$h = -2$	up	$(-2, 0)$	$X = -2$	Yes
(e) $f(x) = (x+4)^2$	$h = -4$	up	$(-4, 0)$	$X = -4$	Yes

p.39 C,D: (Continued)

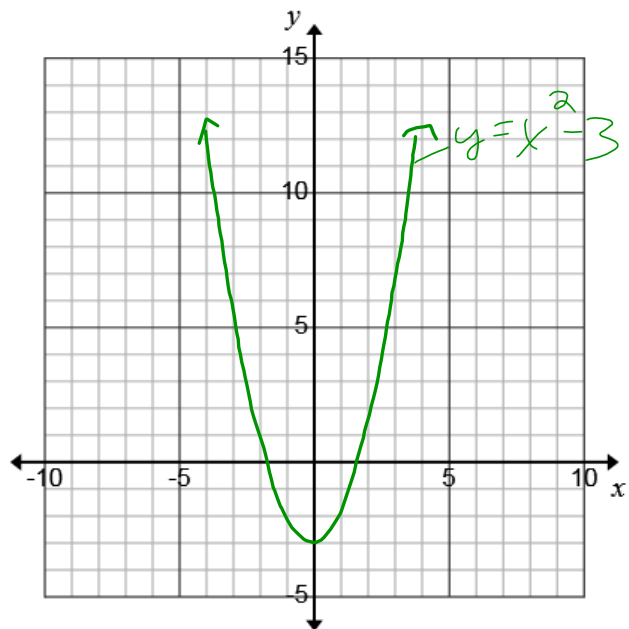
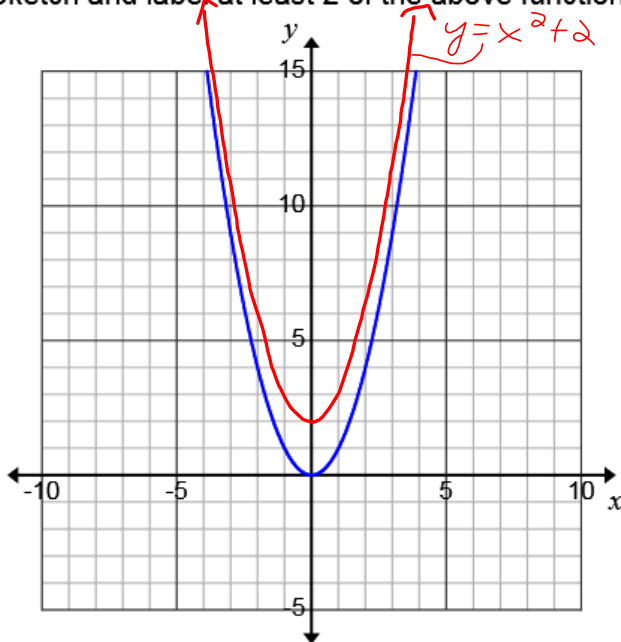
Sketch and label at least 2 of the above functions. $f(x) = x^2$ is shown. (b & e are good choices)



p.38 A,B: Complete the following table using DESMOS on your chromebooks (or prior knowledge of transformations)

Function	value of k in $f(x) = x^2 + k$	direction of opening	vertex	Axis of symmetry	Congruent to $f(x) = x^2$
(a) $f(x) = x^2$	0	up	(0,0)	$X=0$	yes
(b) $f(x) = x^2 + 2$	2	up	(0,2)	$X=0$	yes
(c) $f(x) = x^2 + 4$	4	up	(0,4)	$X=0$	Yes
(d) $f(x) = x^2 - 1$	-1	up	(0,-1)	$X=0$	Yes
(e) $f(x) = x^2 - 3$	-3	up	(0,-3)	$X=0$	Yes

Sketch and label at least 2 of the above functions. $f(x) = x^2$ is shown. (b & e are good choices)



Assigned Practice: Complete all tables and required sketches on this handout.
p. 40 # 1