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★ Chapter 8+4 Test is in 9 days (on a Wednesday)

All of 8.5 (pp. 133 - 136)
All of 8.6 (pp. 137 - 140)

8.5

Identify values of a, h, and k.

(a) (1) $y = 3(x-4)^2 + 9$ — a

(2) $y = 3x^2$ — a

(3) $g(x) = 3(x+8)^2$ — a

(h), (k) $y = 5(x-2)^2 + 9$ — h, k

★ $h = 2$, NOT negative 2.

Vertex = $(2, 9)$

$y = 3(x+1)^2 - 8$

$y = 3(x-(-1))^2 - 8$ — h, k

$h = -1$, $k = -8$

8.5.1

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

$a = -3$, $h = 4$, $k = -2$

$y = 999(x+1)^2 + 8$

$a = 999$, $h = -1$, $k = 8$

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★ Chapter 8+4 Test is in 9 days (on a Wednesday)

All of 8.5 (pp. 133 - 136)
All of 8.6 (pp. 137 - 140)

8.5

Identify values of a, h, and k.

[a] ① $y = 3(x-4)^2 + 9$ (a = 3)

② $y = 3x^2$ (a = 3)

③ $g(x) = 3(x+8)^2$ (a = 3)

[h], [k] $y = 5(x-2)^2 + 9$ (h = 2, k = 9)

★ h = 2, NOT negative 2.

Vertex = (2, 9)

$y = 3(x+1)^2 - 8$

$y = 3(x-(-1))^2 - 8$ (h = -1, k = -8)

8.5.1

$h(x) = -3(x-4)^2 - 2$
$a = -3,\ h = 4,\ k = -2$

$y = 999(x+1)^2 + 8$
$a = 999,\ h = -1,\ k = 8$

$g(x) = 7 + (x+9)^2$

$a = 1$, $h = -9$, $k = 7$

$f(x) = 9x^2 - 9$

$\Rightarrow 9(x-0)^2 - 9$

$a = 9$, $h = 0$, $k = -9$

$y = -(x-9)^2 \underline{\underline{+0}}$

$a = -1$, $h = 9$, $k = 0$

$y = 11x^2$

$11(x-0)^2 + 0$

$a = 11$, $h = 0$, $k = 0$

Graphing Parabolas / Quadratic equation

* See worksheet Side 1

Using (8.5.21): $f(x) = \frac{1}{3}(x-6)^2$ Problem 9

$f(x) = \frac{1}{3}(x-6)^2 + 0$

$a = \frac{1}{3}$, $h = 6$, $k = 0$ ← Put in blanks on worksheet

add and subtract denominator of a.

	x	y
-3	0	12
-3	3	3
	6	0
+3	9	3
+3	12	12

← vertex (h, k)

$f(x) = y$

$y = \frac{1}{3}(x-6)^2$

→ if $x = 0$

$y = \frac{1}{3}(0-6)^2$

$y = \frac{1}{3}(36)$

$y = \frac{1}{3} \cdot \frac{36}{1}$

$y = 12$

→ if $x = 3$

$y = \frac{1}{3}(3-6)^2$

$y = \frac{1}{3}(-3)^2$

$y = \frac{1}{3}(9)$

$y = 3$

→ if $x = 9$

$y = \frac{1}{3}(9-6)^2$

$y = \frac{1}{3}(3)^2$

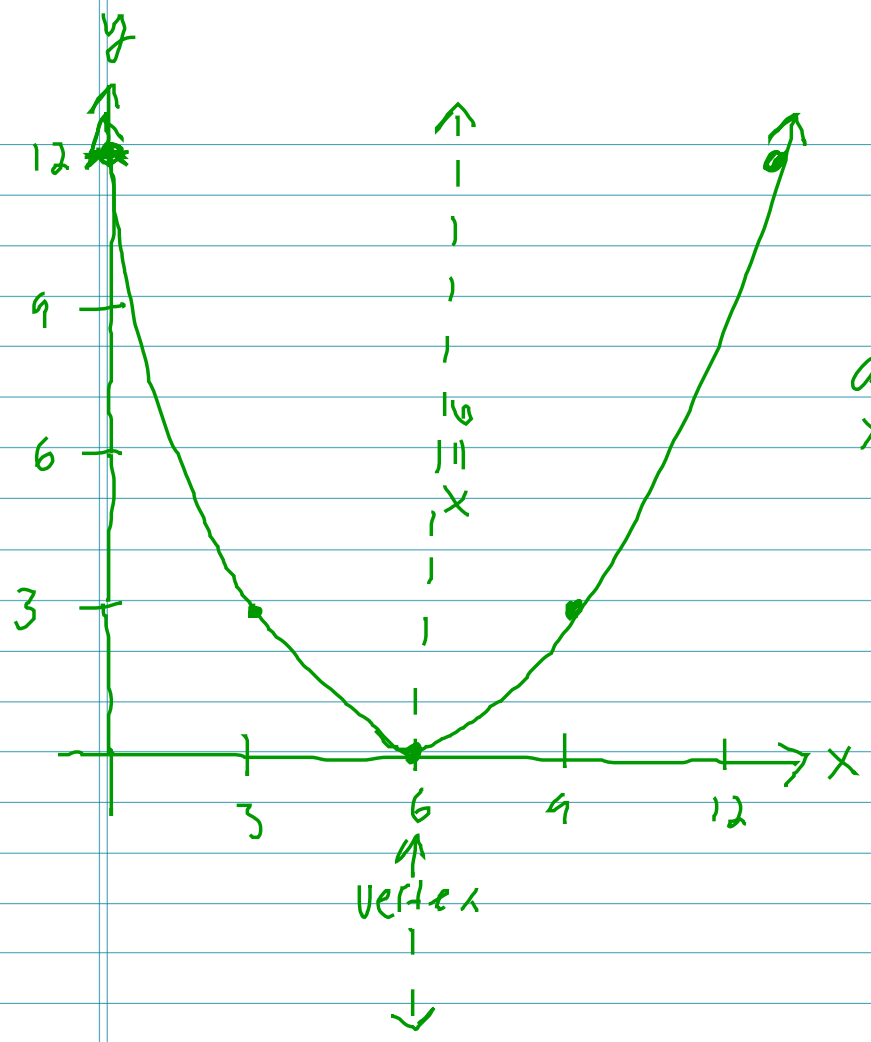
$y = 3$

→ if $x = 12$

$y = \frac{1}{3}(12-6)^2$

$y = \frac{1}{3}(6)^2$

$y = 12$



$f(x) = \frac{1}{3}(x-6)^2$

axis of Symmetry:
$x = 6$

8.5.27

$f(x) = -3(x+4)^2 + 2$

$a = -3$
$h = -4$
$k = 2$

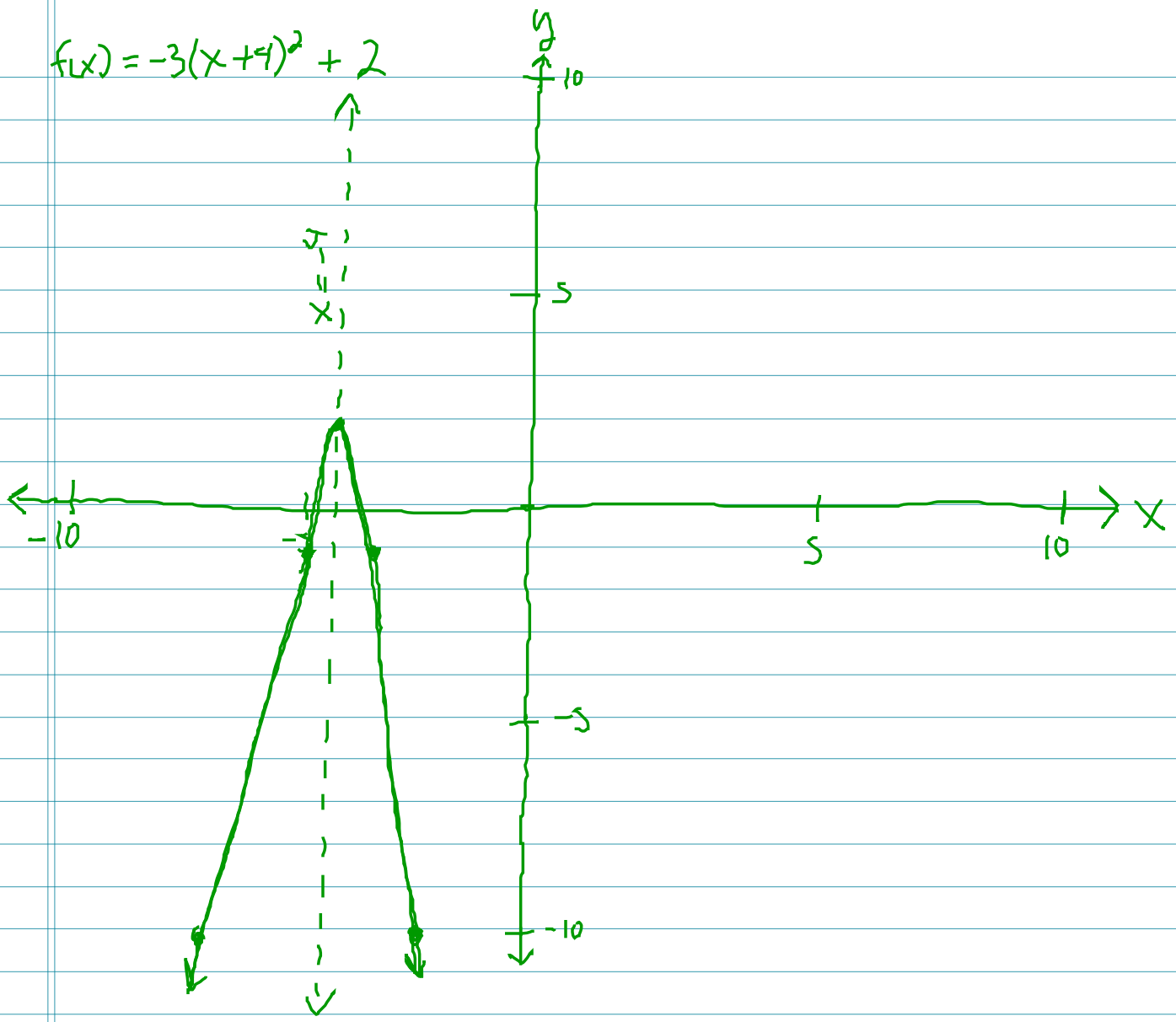
	x	y
-1	-6	-10
-1	-5	-1
	-4	2
+1	-3	-1
+1	-2	-10

Plug x values into original equation to find y.

→ if $x = -6$, $y = -10$
→ if $x = -5$, $y = -1$
→ if $x = -3$, $y = -1$
→ if $x = -2$, $y = -10$

(denominator of $a = 1$)

$f(x) = -3(x+4)^2 + 2$



axis of symmetry: $x = -4$

8.6

find (h, k) vertex using formulas: $\left(\frac{-b}{2a}, c - \frac{b^2}{4a}\right)$

h k

$f(x) = -2x^2 + 12x$

(h, k)

$a = -2,\ b = 12,\ c = 0$

$$\left(\frac{-b}{2a}, c - \frac{b^2}{4a}\right)$$

$$\left(\frac{-12}{2(-2)}, 0 - \frac{12^2}{4(-2)}\right)$$

$$\left(\frac{-12}{-4}, 0 - \frac{144}{-8}\right)$$

$$\left(3, 0 - \boxed{-18}\right)$$

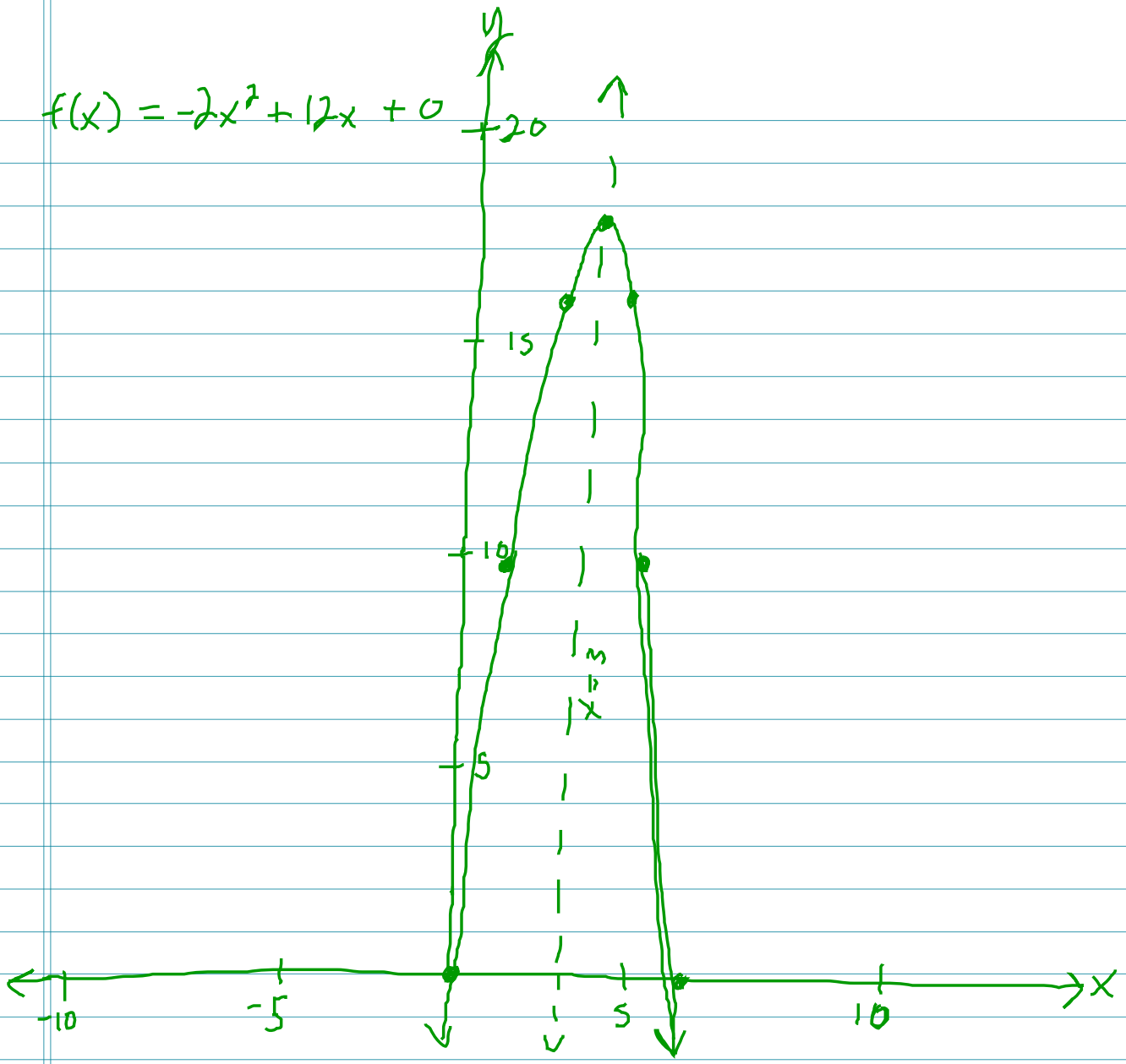
$$(3, 18) \leftarrow \text{Vertex } (h, k)$$

$h = 3$, $k = 18$

	x	y
-1	0	0
-1	1	10
-1	2	16
(h, k)	3	18
+1	4	16
+1	5	10
+1	6	0

denominator of $a = 1$

if $x = 0$, $y = 0$
if $x = 1$, $y = 10$
if $x = 2$, $y = 16$
if $x = 4$, $y = 16$
if $x = 5$, $y = 10$
if $x = 6$, $y = 0$



Remember: When a problem asks for a minimum or maximum, you are looking for the vertex.

8.6.55) $h(t) = -16t^2 + 32t$

(a) because $a < 0$

(b) Find vertex.

$h(t) = -16t^2 + 32t \rightarrow t = x \;.\; h(t) = y$

$f(x) = -16x^2 + 32x \rightarrow t = x \;.\; f(x) = y$

$a = -16 \qquad b = 32 \qquad c = 0$

$$\left(\frac{-32}{2(-16)} , \; 0 - \frac{32^2}{4(-16)} \right)$$

$$\left(1 , \; 0 - \left(\frac{1024}{-64} \right) \right)$$

$$(1, \; 0 - (-16))$$

$$(1, \; 16)$$

x y

~~Maximum height:~~

$(1, \; 16)$

x y

t h

time height

Max height = 16 feet.

How long it takes to reach 16 feet: 1 sec

(8.5.69) $f(x) = -9x^2$ with vertex $(-1, 4)$

h k

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

$f(x) = -9(x+1)^2 + 4$