

Today's Learning Goal(s):

By the end of the class, I will be:

- a) ready for the Unit 4 Summative

Unit Review

Date: NOV. 7 / 16

Review Quiz 1 and Quiz 2

Recognizing a Quadratic Relation

from the equation

$y = x^2$ $y = 5(x-2)^2$, $y = x^2 - 7$, $y = 3x^2 + 2$

from a table of values

2nd differences are constant

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

vertex

$V(h, k)$

moving left/right vs. up/down

recognizing max. vs. min

What IS the max/min value?

direction of opening

stretch vs. compression

Sketching curves in vertex form $y = a(x-h)^2 + k$

$y = -2(x-3)^2 + 5$

$y = 2(x+4)^2 + 7$

$y = \frac{1}{4}(x-5)^2 - 6$

$V(3, 5)$

$V(-4, 7)$

$V(5, -6)$

right 3, up 5

left 4, up 7

right 5, down 6

max, $a < 0$, \checkmark

min, $a > 0$, \curvearrowright

min, $a > 0$, \curvearrowright

max = 5

min = 7

min = -6

down

up

up

vertical stretch by a factor of 2

vertical stretch by a factor of 2

vertical compress

by a factor of $\frac{1}{4}$

Word Problems ... see "Understanding" above

Determining the equation of a parabola

start with the vertex, then substitute another known point for (x, y) and solve to get "a" by itself
write the equation as your conclusion

vertex is $(8, -2)$ through point $(1, 3)$

$y = a(x-8)^2 - 2$

$3 = a(1-8)^2 - 2$

$3 = a(-7)^2 - 2$

$3 = 49a - 2$

$3 + 2 = 49a$

$\frac{5}{49} = \frac{49a}{49}$

$\frac{5}{49} = a$

$\therefore y = \frac{5}{49}(x-8)^2 - 2$ is the equation.

Determining the y-intercept

let $x = 0$, then solve for y

$y = 2x^2 - 7x - 9$

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

$= 2(0)^2 - 7(0) - 9$

$= 2(0-3)^2 + 1$

$= 0 + 0 - 9$

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

$= -9$

$= 2(9) + 1$

$= 18 + 1$

$= 19$

Review Homework:

p. 226 #1, 2, 10* *see below*, 12

* After you do a rough sketch, find the parabola's equation in the form:

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

3 graphs (see below)

p. 228 #1 to 6, 11

Correct Last Day's Homework: (2 pages later)

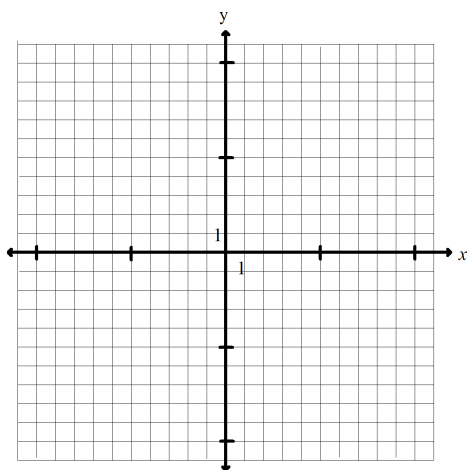
p. 216 #9abc

p. 222 # 1aceg, 2ab, 4, 5*, 7

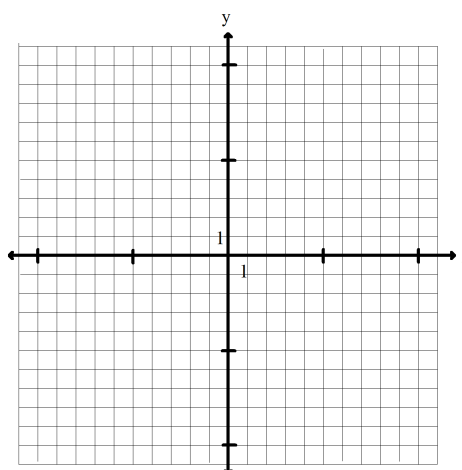
***(use graph paper for #5)**

p. 228 #9

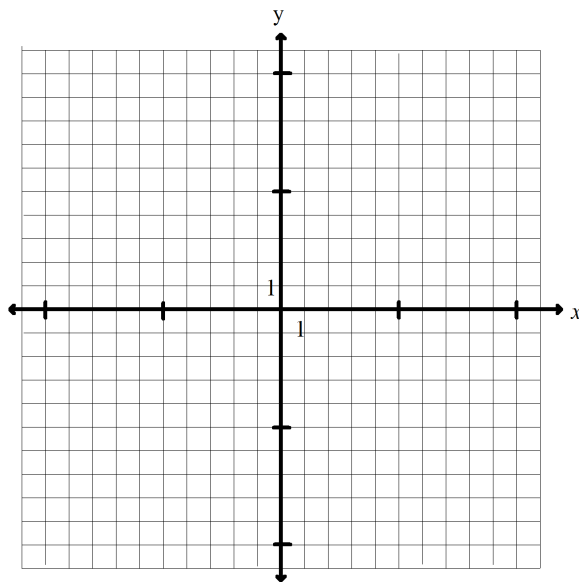
a) $y = (x-4)^2$



b) $y = -x^2 + 4$



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



p.216 9abc

$$h = -0.03(d - 9.5)^2 + 5$$

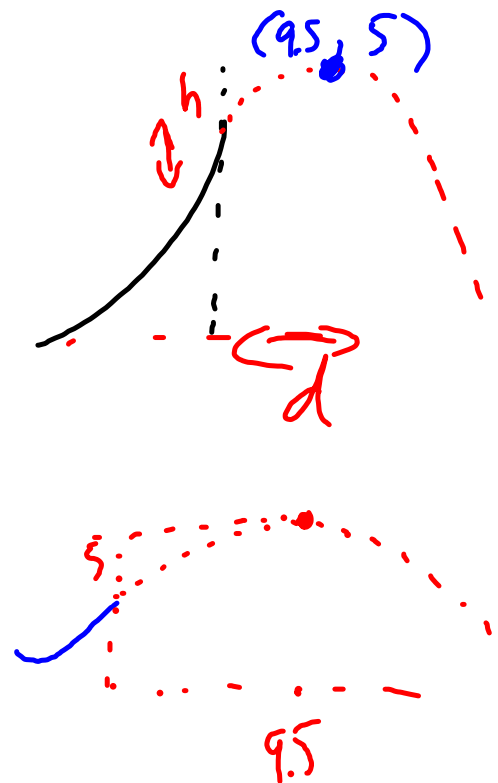
a) find h , if $d = 0$

$$h = -0.03(0 - 9.5)^2 + 5$$

$$= -0.03(-9.5)^2 + 5$$

$$= 2.2925$$

$$= 2.3m$$



p.224 #4 Fireworks

$$h = -4.9(t-2)^2 + 169.6$$

a) the max. height is 169.6 m

it takes 2 sec. to reach the max. height

4b) how high after 5 seconds?

if $t=5$, find h .

$$h = -4.9(t-2)^2 + 169.6$$

$$= -4.9(5-2)^2 + 169.6$$

$$= -4.9(3)^2 + 169.6$$

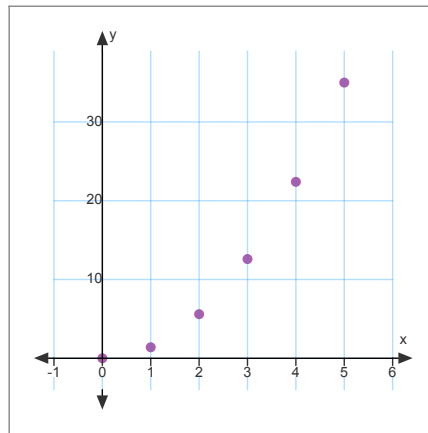
$$= 125.5 \quad \therefore \text{at 5 seconds the rocket is } 125.5 \text{ m above the water}$$

From the 4.5 homework:
p.224 #5 Comparing Cars

Smart Car For two: $d=1.4t^2$

$d = 1.4(t)^2$

t	d
0	0
1	1.4
2	5.6
3	12.6
4	22.4
5	35



c)

Speed =

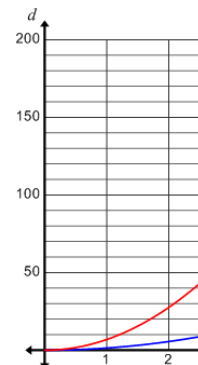
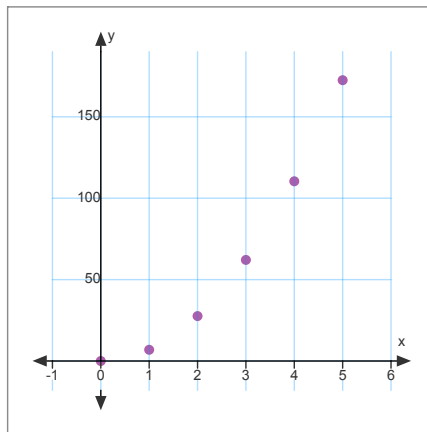
$$\frac{22.4 - 1.4}{4 - 1}$$

$$= \frac{21}{3}$$

$$= 7 \text{ m/s}$$

Tesla Roadster: $d=6.9t^2$

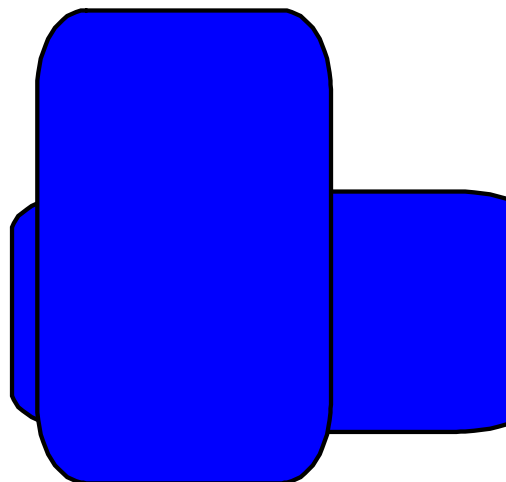
t	d
0	0
1	6.9
2	27.6
3	62.1
4	110.4
5	172.5



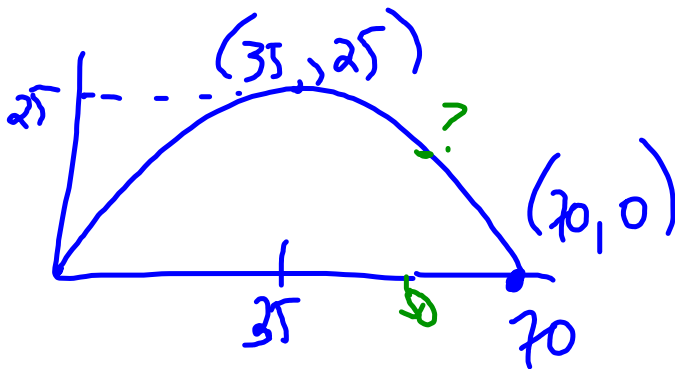
c) $speed = \frac{\Delta d}{\Delta t}$
 $= \frac{110.4 - 6.9}{4 - 1}$
 $= \frac{103.5}{3}$
 $= 34.5 \text{ m/s}$

b) $172.5 - 35$

$\therefore \text{difference} = 137.5 \text{ m}$



From the 4.5 homework:
p.228 #9



$$a) y = a(x-h)^2 + k - 91$$

$$y = a(x-35)^2 + 25$$

$$0 = a(70-35)^2 + 25$$

$$-25 = a(35)^2$$

$$-25 = a(1225)$$

$$\frac{-25}{1225} = a$$

$$a = -0.0204$$

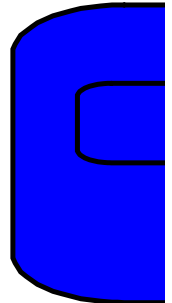
$$\therefore y = -0.0204(x-35)^2 + 25$$

$$b) x = 50$$

$$y = -0.0204(50-35)^2 + 25$$

$$= -0.0204(15)^2 + 25$$

=



P. 226 #1 today's work

a) $y = 3x - 15$

NO!

b) $y = 4x^2 - 2x + 8$

Yes!

c)

x	y
-5	1
0	4
5	16
10	64
15	256

1st Differences

$$4 - 1 = 3$$

$$16 - 4 = 12$$

$$64 - 16 = 48$$

$$192$$

2nd Diff.

$$9$$

$$36$$

$$144$$

\therefore 2nd Diff. will NOT be constant
 \therefore the table does NOT represent a quadratic.