

Announcement:

Chapter 10 Test on
Wednesday, 5/30!

Homework Review - 10.6

$$\textcircled{22} \quad \begin{array}{ccccccc} -4y^2 & -3y & +3 & = & 2y & +4 \\ & -2y & -4 & & -2y & -4 \end{array}$$

$$-4y^2 - 5y - 1 = 0$$

$$a = -4 \quad b = -5 \quad c = -1$$

$$\begin{aligned} x &= \frac{-(-5) - \sqrt{(-5)^2 - 4(-4)(-1)}}{2(-4)} \\ &= \frac{5 - \sqrt{25 - 16}}{-8} \\ &= \frac{5 - \sqrt{9}}{-8} = \frac{5 - 3}{-8} = \frac{2}{-8} = -\frac{1}{4} \end{aligned}$$

$$\text{or} \quad \frac{5 + \sqrt{9}}{-8} = \frac{5 + 3}{-8} = \frac{8}{-8} = -1$$

$$x = -\frac{1}{4} \quad \text{or} \quad x = -1$$

$$y = -46.7x^2 + 169x + 2656$$

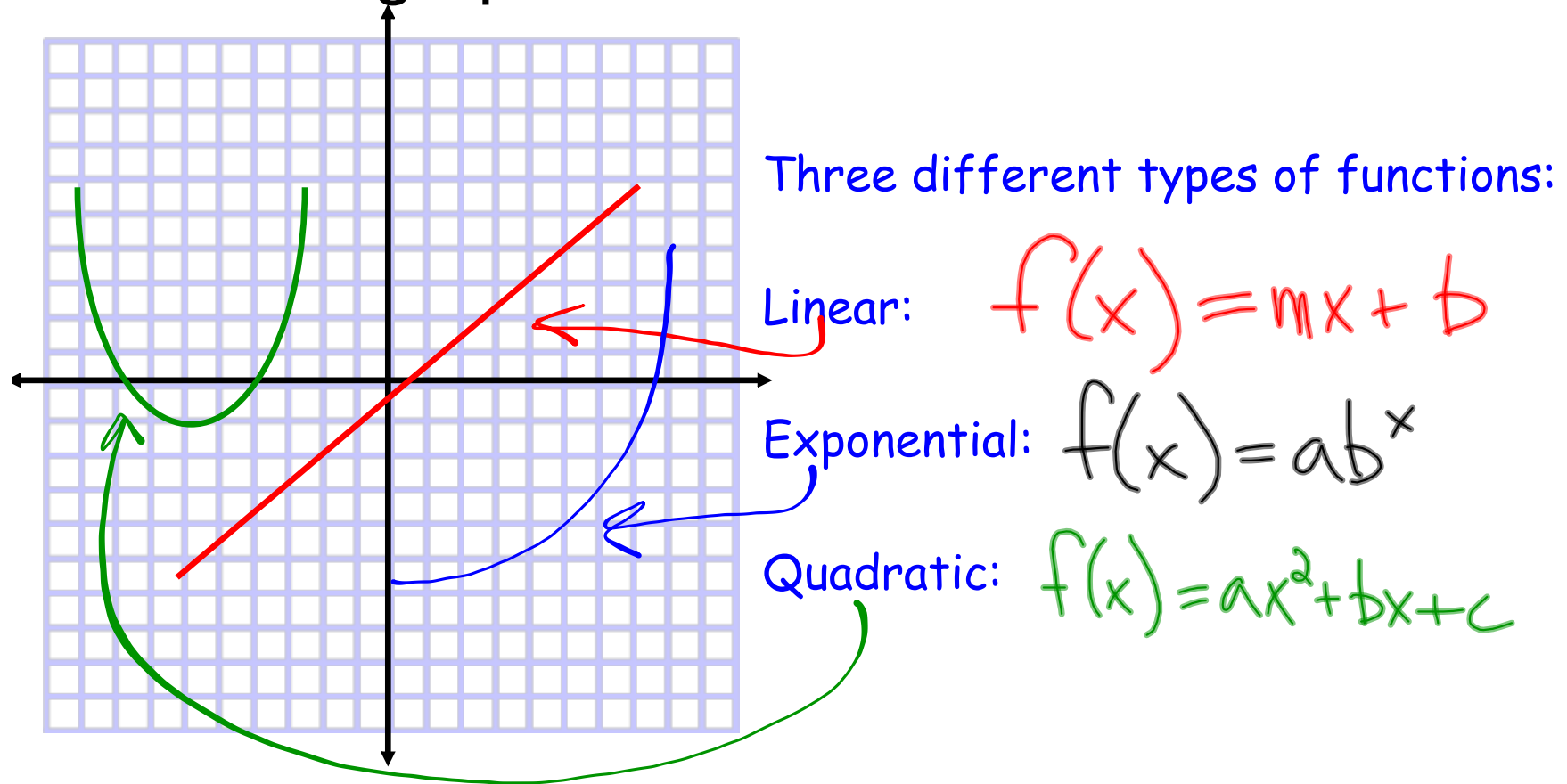
$$\begin{array}{rcl} 2,500 & = & -50x^2 + 150x + 2656 \\ -2,500 & & -2,500 \end{array}$$

$$\begin{array}{rcl} -50x^2 + 150x + 150 & = & 0 \\ \hline & -50 & \end{array}$$

$$\begin{array}{rcl} x^2 - 3x & = & 0 \\ a=1 & b=-3 & c=150 \end{array}$$

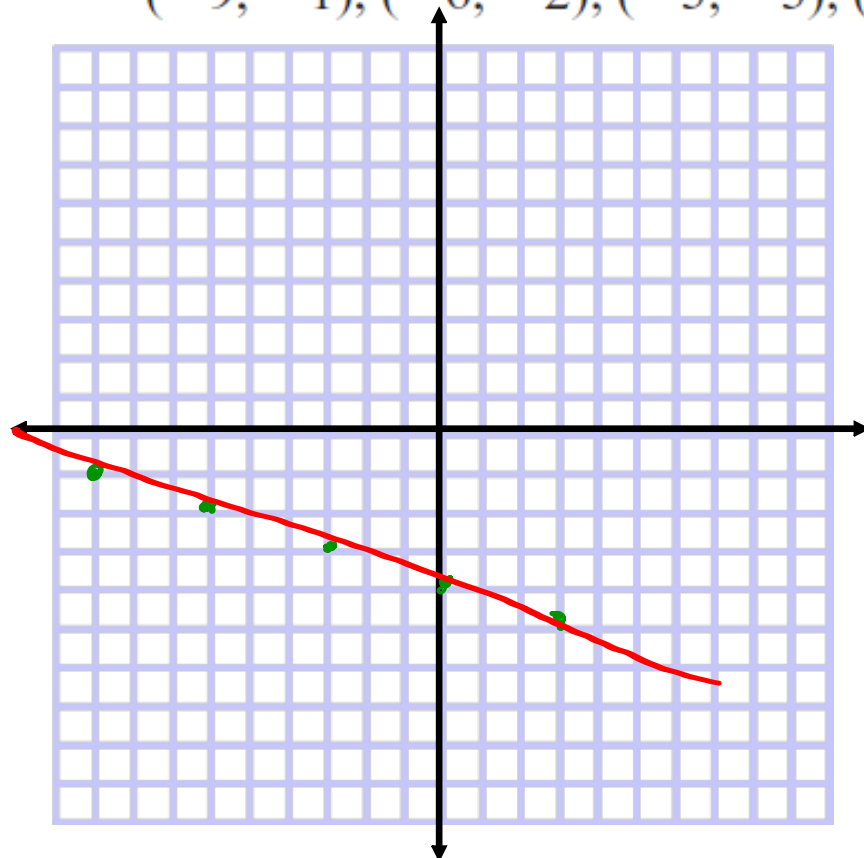
$$\begin{array}{rcl} -(-3) & \sqrt{9 - 4(1)(150)} & \\ 9 & 3 & \end{array}$$

Comparing Linear, Exponential, and Quadratic graphs



Determining the type of function from ordered pairs:

$(-9, -1), (-6, -2), (-3, -3), (0, -4), (3, -5)$



x/y

x y

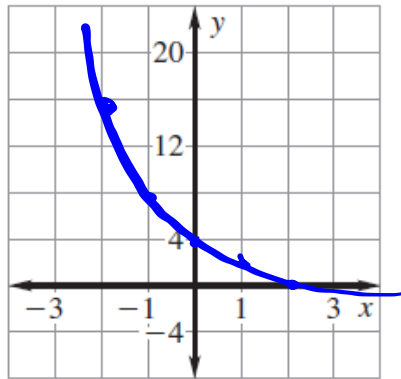
Graph the ordered pairs ✓

Sketch the curve or line ✓

Describe the graph ✓

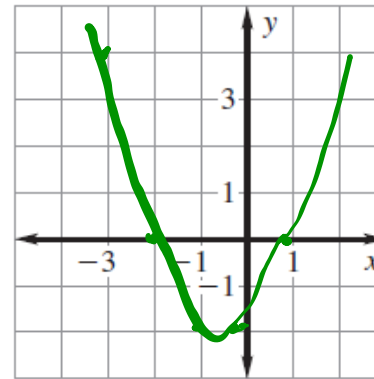
LINEAR

4. $(-2, 16), (-1, 8), (0, 4), (1, 2), (2, 1)$



Exponential

5. $(-3, 4), (-2, 0), (-1, -2), (0, -2), (1, 0)$



Quadratic

Use Differences and Ratios to Determine the Type of Function:

x	-2	-1	0	1	2
y	-10	-7	-4	-1	2

$$\begin{array}{l} -7 - (-10) = 3 \\ -4 - (-7) = 3 \\ 2 - (-1) = 3 \end{array}$$

x	-1	0	1	2	3
y	4	1	0	1	4

$$\begin{array}{l} 1 - 4 = -3 \\ 0 - 1 = -1 \\ 1 - 0 = 1 \\ 4 - 1 = 3 \\ \hline -3 - (-1) = -2 \\ -1 - 0 = -1 \\ 1 - 1 = 0 \\ 3 - 1 = 2 \end{array}$$

x	0	1	2	3	4
y	1	5	25	125	625

$$\begin{array}{l} 5 - 1 = 4 \\ 25 - 5 = 20 \\ 125 - 25 = 100 \\ 625 - 125 = 500 \\ \hline 20 - 4 = 16 \\ 100 - 20 = 80 \\ 500 - 100 = 400 \end{array}$$

$$\frac{5}{1} = 5 \quad \frac{25}{5} = 5 \quad \frac{125}{25} = 5 \quad \frac{625}{125} = 5$$

Y-values

Linear: constant difference
(Same distance between y's)

Quadratic: constant second difference
(Same distance between the distances!)

Exponential: Constant ratio
(Same ratio between y values)

14.

x	-2	-1	0	1	2
y	32	8	2	$\frac{1}{2}$	$\frac{1}{8}$

Expofreakinential

$$\frac{8}{32} = \frac{1}{4} \quad \frac{2}{8} = \frac{1}{4}$$

$$\frac{\frac{1}{2}}{2} = \frac{1}{2} \div 2 = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$\frac{\frac{1}{8}}{\frac{1}{2}} = \frac{1}{8} \div \frac{1}{2} = \frac{1}{8} \cdot \frac{2}{1} = \frac{2}{8} = \frac{1}{4}$$

15.

x	-4	-3	-2	-1	0
y	-3	0	1	0	-3

Quadriflipinatic

3 1 -1 -3
-2 -2 -2

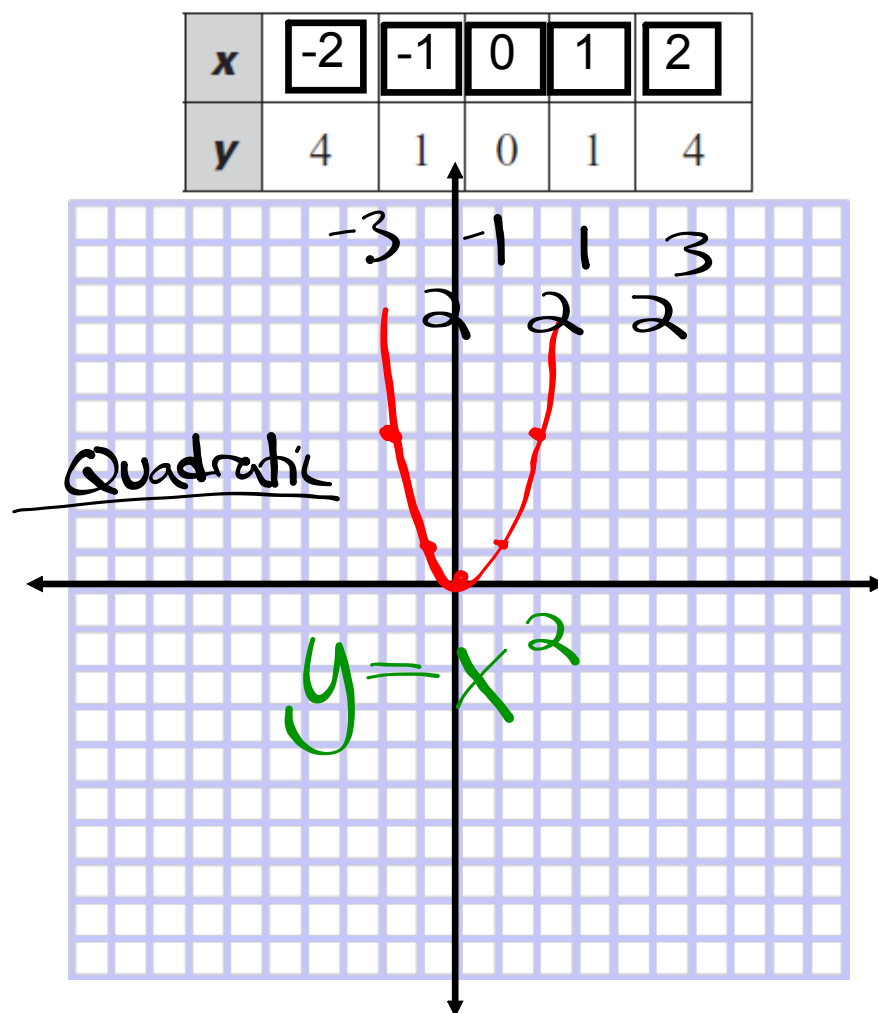
16.

x	-2	-1	0	1	2
y	1	3	5	7	9

2 2 2 2

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Write an Equation for the Function:



Use x,y coordinate pairs from the graph to determine the function (not 0,0)!

(assume quadratic is $y=ax^2$)
 $4=a(2)^2$ $\frac{4}{4}=\frac{a \cdot 4}{4}$ $a=1$

(assume exponential is $y=ab^x$;
 pick the point where $x = 0$ to find a , then pick the point where $x = 1$ to find b)

15.

x	-2	-1	0	1	2
y	-4	-1	0	-1	-4

Quadratic
 $y = -x^2$

$$y = ax^2$$

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

$$\frac{-4}{4} = \frac{a \cdot 4}{4} \quad a = -1$$

14.

			1 st	2 nd	
x	-2	-1	0	1	2
y	32	8	2	$\frac{1}{2}$	$\frac{1}{8}$

Exponential

$$y = 2 \cdot \left(\frac{1}{4}\right)^x$$

$$\frac{1}{2} \div 2 =$$

$$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$y = a \cdot b^x$$

$$2 = a \cdot b^0 \quad (b^0 = 1)$$

$$2 = a$$

$$y = 2 \cdot b^x$$

$$\frac{1}{2} = 2 \cdot b^1$$

$$\frac{\frac{1}{2}}{2} = \frac{2 \cdot b}{2}$$

$$b = \frac{1}{4}$$

Computer Value The value V of a computer between 1999 and 2003 is given in the table. Tell whether the data should be modeled by a *linear function*, an *exponential function*, or a *quadratic function*. Then write an equation for the function.

Years since 1999, x	0	1	2	3	4
Value, V (dollars) y	800	725	650	575	500

$-75 \ -75 \ -75 \ -75$
linear

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{725 - 800}{1 - 0} = \frac{-75}{1} = -75$$

$$y = -75x + b$$

$$800 = -75(0) + b$$

$$800 = b$$

$$y = -75x + 800$$

Homework:

p. 688, 3-5, 7-17 odd, 23, 27