

Announcement:

Chapter 10 Test on  
Tuesday, 1/17! (1st day  
after long weekend...)

## Homework Review - 10.6

$$\textcircled{15} \quad 2m^2 + 9m + 7 = 3$$

$$2m^2 + 9m + 4 = 0$$

$$\frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-9 + \sqrt{9^2 - 4(2)(4)}}{2(2)}$$

$$\frac{-9 + \sqrt{81 - 32}}{4}$$

$$\frac{-9 + \sqrt{49}}{4}$$

$$\frac{-9 + 7}{4}$$

$$\frac{-2}{4} = \boxed{-\frac{1}{2}}$$

$$\frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-9 - \sqrt{9^2 - 4(2)(4)}}{2(2)}$$

$$\frac{-9 - \sqrt{81 - 32}}{4}$$

$$\frac{-9 - \sqrt{49}}{4}$$

$$\frac{-9 - 7}{4}$$

$$\frac{-16}{4} = \boxed{-4}$$

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

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

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-5) + \sqrt{(-5)^2 + (-4)(-4)(-1)}}{2(-4)} = -1$$

$$\frac{-(-5) - \sqrt{(-5)^2 + (-4)(-4)(-1)}}{2(-4)} = -0.25, \quad -\frac{1}{4}$$

(47)

$$16 = 0.7x^2 - 4.3x + 5.5$$

$$0 = 0.7x^2 + -4.3x + -10.5$$

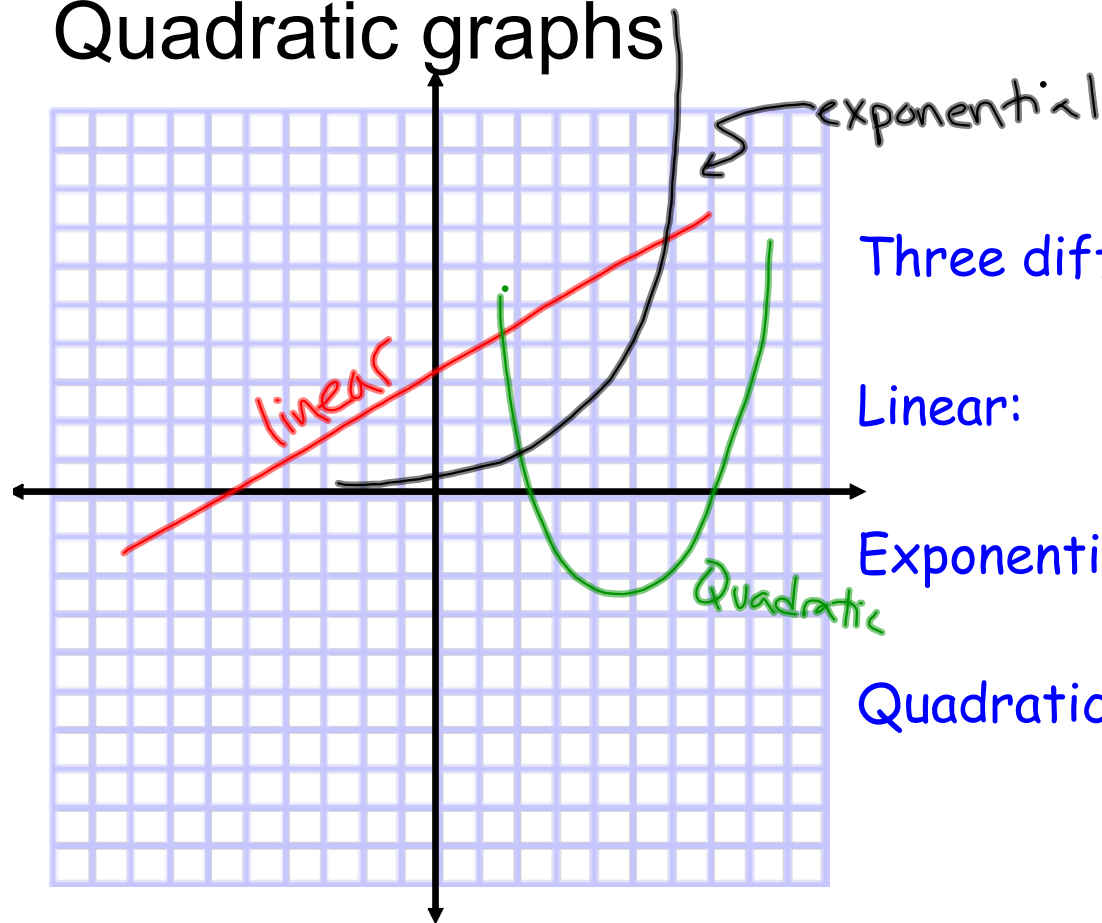
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-4.3) + \sqrt{(-4.3)^2 + (-4)(0.7)(-10.5)}}{2(0.7)} = 8$$

$$1985 + 8 = \boxed{1993}$$



# Comparing Linear, Exponential, and Quadratic graphs



Three different types of functions:

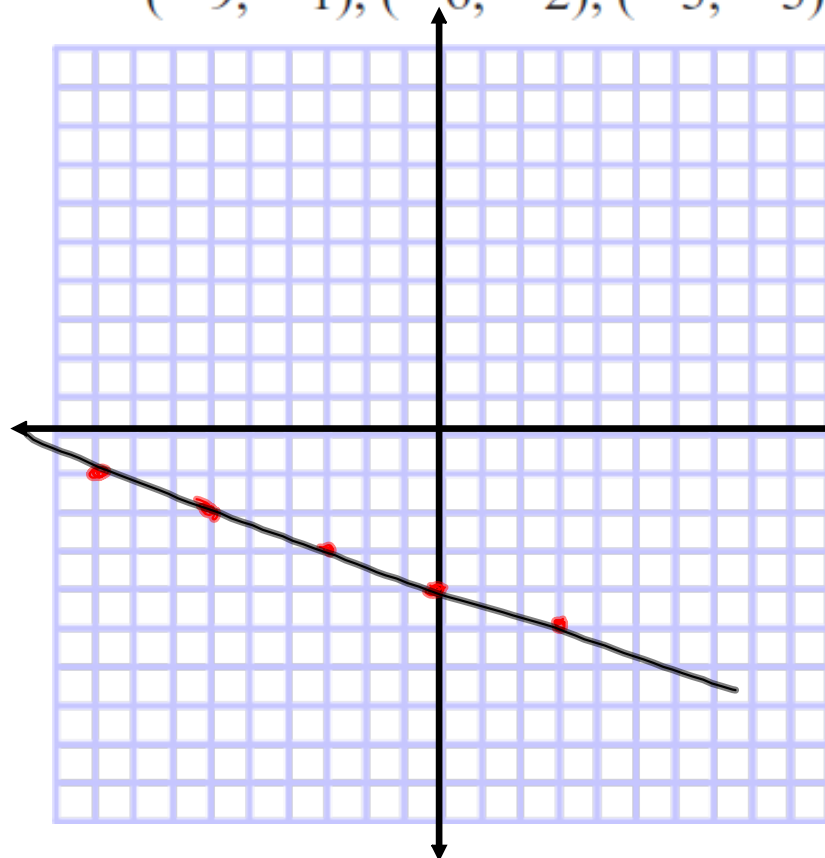
Linear:  $f(x) = mx + b$

Exponential:  $f(x) = ab^x$

Quadratic:  $f(x) = ax^2 + bx + c$

# Determining the type of function from ordered pairs:

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



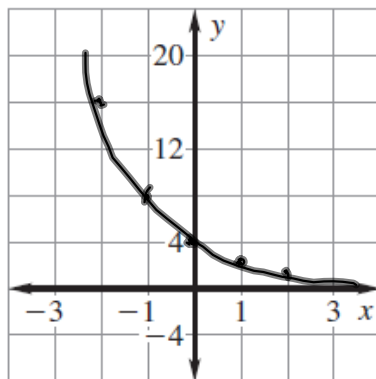
✓ Graph the ordered pairs

✓ Sketch the curve or line

✓ Describe the graph

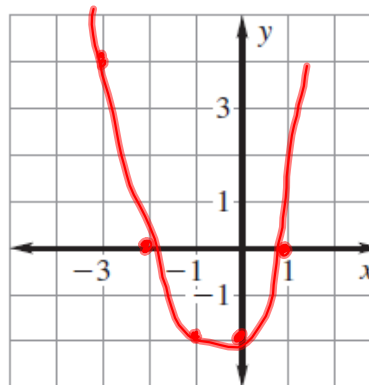
LINEAR

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:

<b>x</b>	-2	-1	0	1	2
<b>y</b>	-10	-7	-4	-1	2

$+3 \quad +3 \quad +3 \quad +3$

Linear: constant difference

<b>x</b>	-1	0	1	2	3
<b>y</b>	4	1	0	1	4

$-3 \quad -1 \quad 1 \quad 3$  (first differences)
  
 $2 \quad 2 \quad 2$  (second differences)

Quadratic: constant second difference

<b>x</b>	0	1	2	3	4
<b>y</b>	1	5	25	125	625

$1:5 \quad 5:25 \quad 25:125 \quad 125:625$ 
  
 $1:5 \quad 1:5 \quad 1:5$

Exponential: Constant ratio



14.

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

E

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

15.

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

Q

$$\begin{array}{ccccccc} & \text{3} & & \text{1} & & \text{-1} & & \text{-3} \\ & \text{3} & & \text{1} & & \text{-1} & & \text{-3} \\ & \text{3} & & \text{1} & & \text{-1} & & \text{-3} \\ & \text{3} & & \text{1} & & \text{-1} & & \text{-3} \end{array}$$

16.

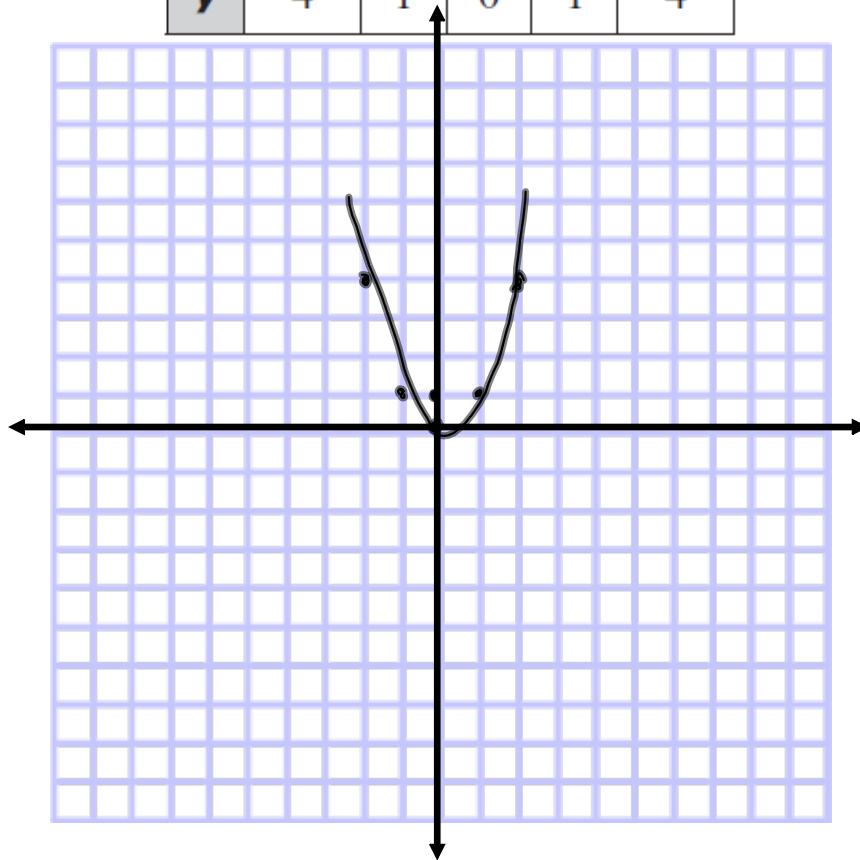
$x$	-2	-1	0	1	2
$y$	1	3	5	7	9

L

$$\begin{array}{ccccccc} & \text{2} & & \text{2} & & \text{2} & & \text{2} \\ & \text{2} & & \text{2} & & \text{2} & & \text{2} \\ & \text{2} & & \text{2} & & \text{2} & & \text{2} \\ & \text{2} & & \text{2} & & \text{2} & & \text{2} \end{array}$$

# Write an Equation for the Function:

<b>x</b>	-2	-1	0	1	2
<b>y</b>	4	1	0	1	4



$$1 = a(1)^2$$

$$1 = a$$

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

(assume quadratic is  $y = ax^2$ )

$$y = x^2$$

(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.

<b>x</b>	-2	-1	0	1	2
<b>y</b>	-4	-1	0	-1	-4

$$y = -x^2$$

$$y = ax^2$$

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

$$-1 = a(1)$$

$$-1 = a$$

14.

<b>x</b>	-2	-1	0	1	2
<b>y</b>	32	8	2	$\frac{1}{2}$	$\frac{1}{8}$

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

$$y = ab^x$$

$$2 = ab^0$$

$$2 = a(1)$$

$$a = 2$$

$$x = 0$$

$$x = 1$$

$$y = 2b^x$$

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

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

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

**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, $t$	0	1	2	3	4
Value, $V$ (dollars)	800	725	650	575	500

Homework:

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