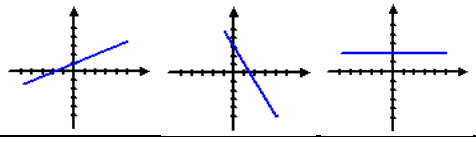
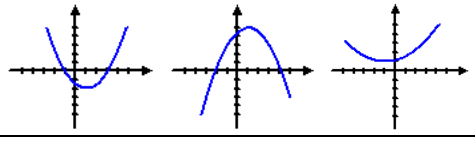
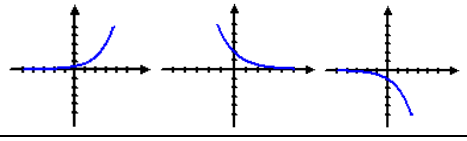
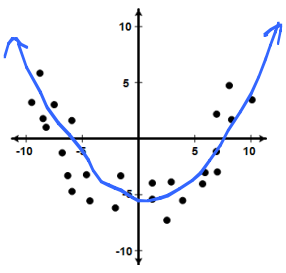
Sec 5.1 – Identifying the Function
Linear, Quadratic, or Exponential Functions

Name:

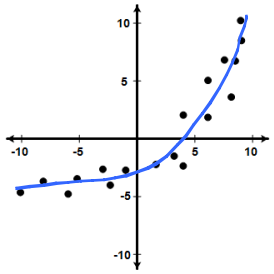
GRAPHICAL EXAMPLES

LINEAR FUNCTIONS	QUADRATIC FUNCTIONS	EXPONENTIAL FUNCTIONS
		

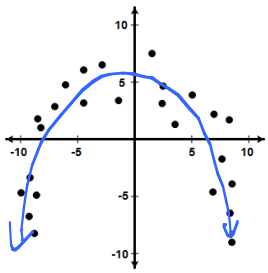
1. Graphically identify which type of function model might best represent each scatter plot.



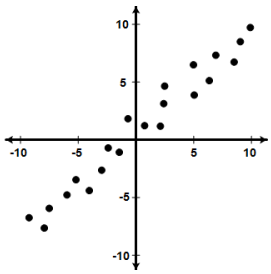
Model (circle one): **Linear** **Quadratic** **Exponential**



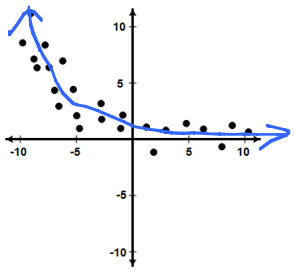
Model (circle one): **Linear** **Quadratic** **Exponential**



Model (circle one): **Linear** **Quadratic** **Exponential**



Model (circle one): **Linear** **Quadratic** **Exponential**



Model (circle one): **Linear** **Quadratic** **Exponential**

2. Match each graph with its description.

f I. An **exponential** function that is always **increasing**.

c II. An **exponential** function that is always **decreasing**.

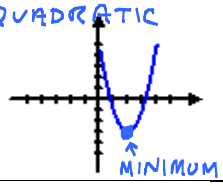
e III. A **quadratic** function with a **local maximum**.

a IV. A **quadratic** function with a **local minimum**.

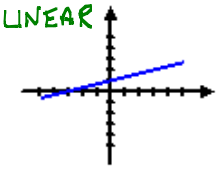
b V. A **linear** function that is always **increasing**.

d VI. A **linear** function that is always **decreasing**.

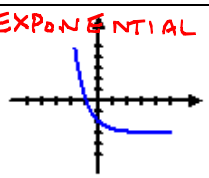
a. QUADRATIC



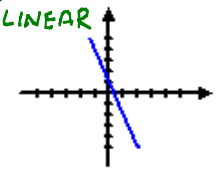
b. LINEAR



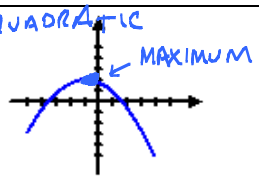
c. EXPONENTIAL



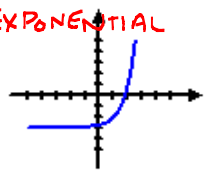
d. LINEAR



e. QUADRATIC



f. EXPONENTIAL



3. Which is the only type of function below that has an asymptote when graphed?

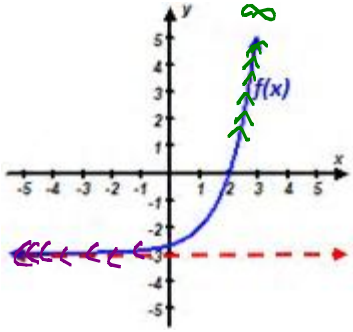
A. Linear Function B. Quadratic Function C. Exponential Function

4. Which is the only type of function below that could have a local maximum?

A. Linear Function B. Quadratic Function C. Exponential Function

5. Describe the end behavior of each of the function below.

A.

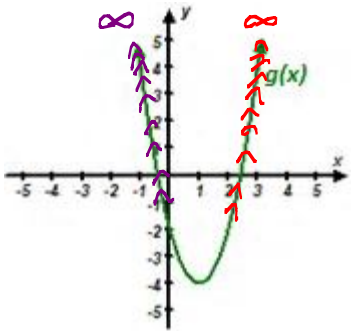


Name: EXPONENTIAL

As $x \to -\infty$, $f(x) \to$ -3 (LEFT)

As $x \to \infty$, $f(x) \to \infty$ (RIGHT, UP)

B.

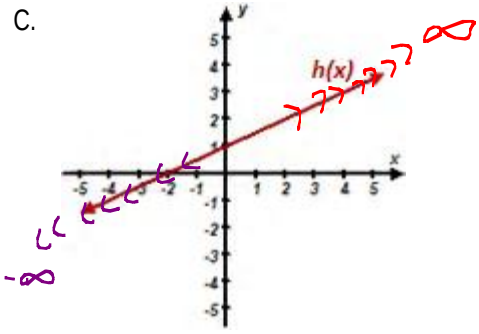


Name: QUADRATIC

As $x \to -\infty$, $g(x) \to \infty$ (LEFT, UP)

As $x \to \infty$, $g(x) \to \infty$ (RIGHT, UP)

C.



Name: LINEAR

As $x \to -\infty$, $h(x) \to -\infty$ (LEFT, DOWN)

As $x \to \infty$, $h(x) \to \infty$ (RIGHT, UP)

6. Which is the only function that might have end behavior such that as ***x*** approaches infinity, ***f(x)*** approaches 4?

($x \to \infty$ RIGHT; $f(x) \to 4$)

A. Linear Function (POSSIBLE) B. Quadratic Function C. Exponential Function (POSSIBLE)

7. Which is the only function below that might have end behavior such that:

- As $x \to -\infty$, $f(x) \to \infty$ (LEFT, UP)
- As $x \to \infty$, $f(x) \to \infty$ (RIGHT, UP)

A. Linear Function B. Quadratic Function C. Exponential Function

8. Which is the only function below that might have end behavior such that:

- As $x \to -\infty$, $f(x) \to -\infty$ (LEFT, DOWN)
- As $x \to \infty$, $f(x) \to \infty$ (RIGHT, UP)

A. Linear Function B. Quadratic Function C. Exponential Function

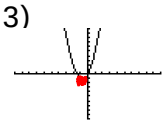
9. Which is the only function below that might have end behavior such that:

- As $x \to -\infty$, $f(x) \to -\infty$ (LEFT, DOWN)
- As $x \to \infty$, $f(x) \to -\infty$ (RIGHT, DOWN)

A. Linear Function B. Quadratic Function C. Exponential Function

10. Based on the function given identify which description best fits the function.

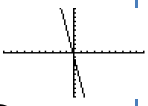
A. $f(x) = x(2x + 3)$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

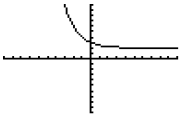
B. $g(x) = 3(1 - 2x) - 4$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

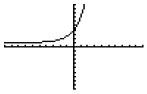
C. $h(x) = 2 + \left(\frac{1}{2}\right)^x$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

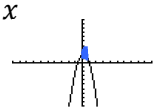
D. $m(x) = 3 \cdot (2)^x + 1$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

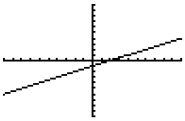
E. $p(x) = 2 - 3x^2 + x$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

F. $q(x) = \frac{1}{2}x - 1$



Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

11. Based on the partial set of values given for a function, identify which description best fits the function.

x	0	1	2	3	4
$a(x)$	1	5	9	13	17

4 4 4 4

LINEAR BECAUSE THE FIRST DIFFERENCE IS CONSTANT (i.e. CONSTANT RATE OF CHANGE)

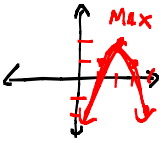
Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

x	1	2	3	4	5
$b(x)$	1	2	1	-2	-7

-1 -3 -5

-2 -2 -2



SECOND DIFFERENCE IS CONSTANT WHICH SUGGESTS THAT IT IS QUADRATIC

Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

x	1	2	3	4	5
$c(x)$	0	2	6	14	30

2 4 8 16

2 4 8

EACH DIFFERENCE IS A CONSITENT MULTIPLE OF THE LAST WHICH SUGGESTS AN EXPONENTIAL FUNCTION

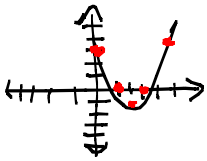
Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

x	0	1	2	3	4
$d(x)$	3	0	-1	0	3

-3 -1 1 3

2 2 2



SECOND DIFFERENCE IS CONSTANT WHICH SUGGESTS THAT IT IS QUADRATIC

Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

x	1	2	3	4	5
$e(x)$	65	33	17	9	5

-32 -16 -8 -4

EACH DIFFERENCE IS A CONSITENT MULTIPLE OF THE LAST WHICH SUGGESTS AN EXPONENTIAL FUNCTION

Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay

x	1	2	3	4	5
$f(x)$	9	7	5	3	1

-2 -2 -2 -2

LINEAR BECAUSE THE FIRST DIFFERENCE IS CONSTANT (i.e. CONSTANT RATE OF CHANGE)

Model (circle one):

Linear Growth	Quadratic (Local Max)	Exponential Growth
Linear Decay	Quadratic (Local Min)	Exponential Decay