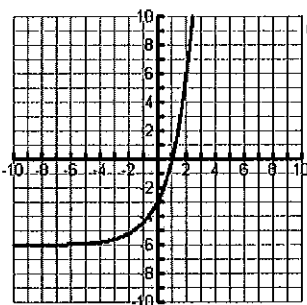


**Growth vs. Decay**

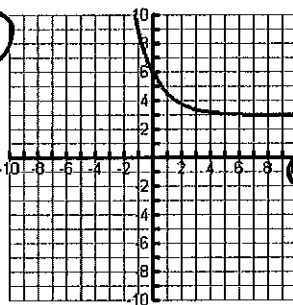
1. Circle the appropriate description of each graph.

A)



Exponential Growth

Exponential Decay



Exponential Growth

Exponential Decay

Circle the appropriate description of each equation.

B)  $f(x) = 4\left(\frac{5}{2}\right)^x$

Exponential Growth

Exponential Decay

$y = .3\left(\bar{8}\right)^x$

Exponential Growth

Exponential Decay

**Factors, Rates, and Initial Values**

2. Given  $y = 1.23^x$ , identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor 1.23

Growth/Decay Rate .23

Initial Value 1

3. Given  $f(x) = 3\left(\frac{4}{5}\right)^x$ , identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor  $\frac{4}{5}$  OR .8

Growth/Decay Rate  $\frac{1}{5}$  OR .2

Initial Value 3

4. Given  $f(x) = 0.75(0.60)^x$ , identify the growth/decay factor, growth/decay rate, and the initial value.

Growth/Decay Factor .60

Growth/Decay Rate .40

Initial Value 0.75

## Equations from Context

5. A Gila Monster is about 16 cm long at birth. During the beginning of its life, the Gila Monster's length increases by about 15% each week.

### Gila Monster

Write a function that models the length of the ~~cuticle~~ at the beginning of the Gila Monster's life. Use  $x$  for the number of weeks and  $y$  for the length of the Gila Monster.

$$y = 16(1.15)^x$$

Find the length of the Gila Monster at the end of the 3 weeks.

$$y = 16(1.15)^3$$

$$y = 24.334 \text{ cm}$$

6. Sam takes an 800 mg Ibuprofen for her nagging backache. Every hour that the Ibuprofen is in her system, a quarter of the medicine dissolves in her body. (These are made up facts. Always consult your physician or pharmacist before taking medication)

Write a function that models the amount of Ibuprofen in Sam's body over time. Use  $x$  for hours, and  $y$  for the amount of Ibuprofen, in mg, remaining in the body.

$$y = 800(.75)^x$$

When there is less than 200mg of medicine left in the body, it is safe to take it again. How long will it take before Sam can take more medicine?

X	Y
0	800
1	600
2	450
3	337.5
4	253.125

X	Y
5	189.84

after 5 hours

## Equations from Tables

7. Write an exponential function that models the points in the table.

X	Y
0	320
1	80
2	20
3	5
4	1.25

.25  
.25  
.25  
.25

Factor: .25  
I.V.: 320

$$y = 320(.25)^x$$

X	Y
0	-1
1	-3
2	-9
3	-27
4	-81

3  
3  
3  
3

Factor = 3  
I.V. = -1

$$y = -1(3)^x \text{ OR } y = -3^x$$