

Module 4 Practice

Linear and Exponential Functions

Name _____ KEY _____

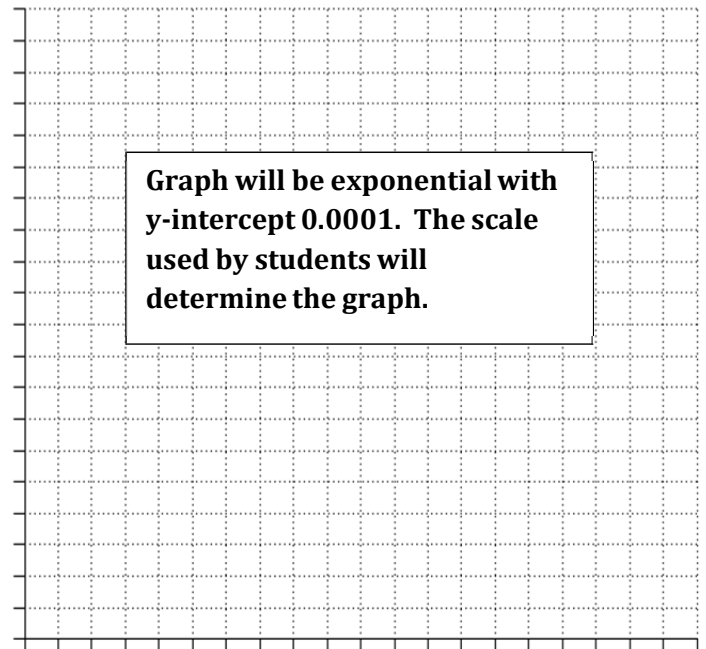
The mold on a piece of bread has an area of 0.0001 mm^2 . The area of mold on the bread triples every day, and the surface area of the bread is 500 mm^2 .

1. For this situation, is the growth of mold on the bread with respect to time continuous or discrete?

Answers should be two of the following three words: Continuous, Exponential, Increasing

2. Create a table and a graph describing *time* and *area* in the situation above. Make sure everything is clearly labeled and easy to read.

<i>Hour</i>	<i>Area of Mold</i>
<i>0</i>	<i>0.0001</i>
<i>1</i>	<i>0.0003</i>
<i>2</i>	<i>0.0009</i>
<i>3</i>	<i>0.0027</i>
<i>4</i>	<i>0.0081</i>



3. Write a function of the area of the mold with respect to the time it has been growing.

$$h(x) = 0.001(3)^x$$

4. About how long will it take for the mold to cover the entire surface of the bread?

Around 14 days

For each representation of a function, decide if the function is linear, exponential, or neither.

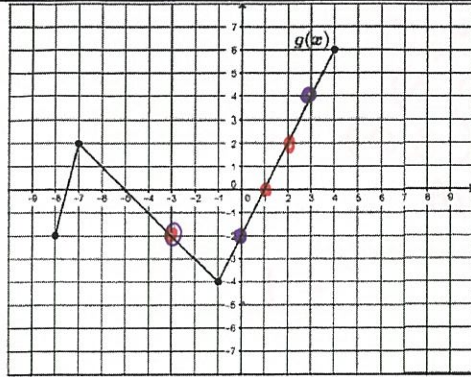
exponential

linear

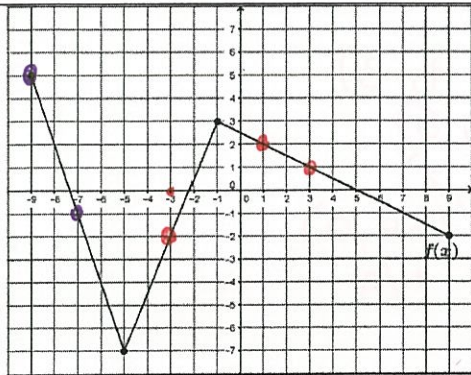
5. The population of a town is decreasing at a rate of 1.5% per year.
6. Joan earns a salary of \$30,000 per year plus a \$400 bonus



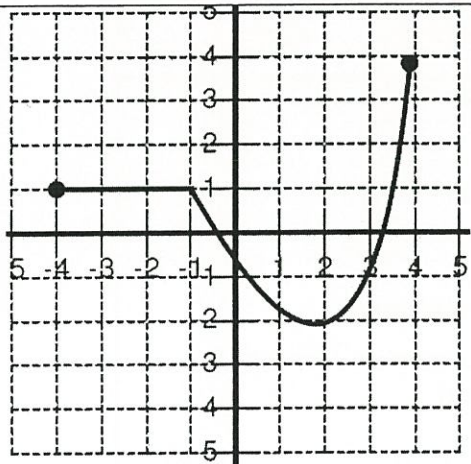
Module 5 Review Worksheet



1. Find $g(-3) = \underline{-2}$
2. Find $g(2) = \underline{2}$
3. Find $g(1) = \underline{0}$
4. Find when $g(x) = -2$, $x = \underline{0, -3}$
5. Find when $g(x) = 4$, $x = \underline{3}$
6. Find when $g(x) = -5$, $x = \underline{N/A}$

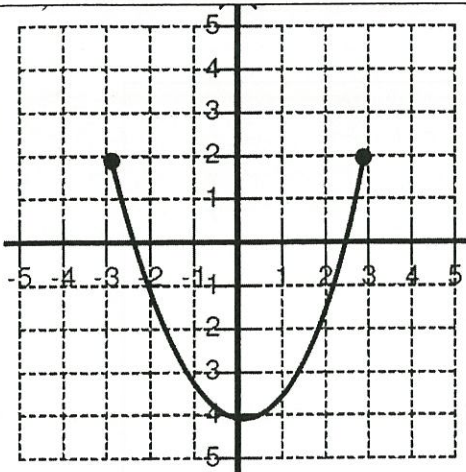


1. Find $f(-3) = \underline{2}$
2. Find $f(3) = \underline{1}$
3. Find $f(1) = \underline{2}$
4. Find when $f(x) = -9$, $x = \underline{N/A}$
5. Find when $f(x) = 5$, $x = \underline{-9}$
6. Find when $f(x) = -7$, $x = \underline{-1}$



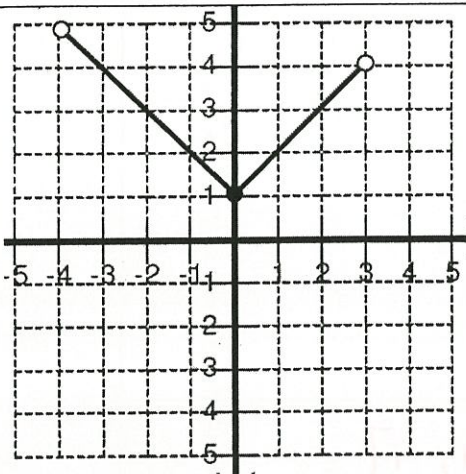
Find intervals for the following:

1. Domain: $\underline{[-4, 4]}$
2. Range: $\underline{[-2, 4]}$
3. Increasing: $\underline{(2, 4)}$
4. Decreasing: $\underline{(-1, 2)}$
5. Constant: $\underline{(-4, -1)}$
6. Find the minimum and maximum of the graph:
 Max: $\underline{4}$ Min: $\underline{-2}$



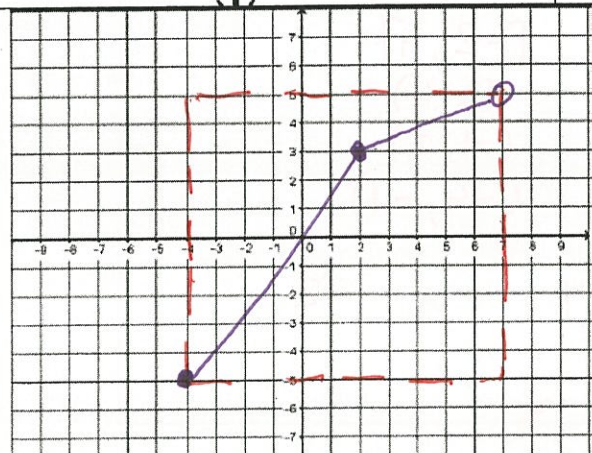
Find intervals for the following:

1. Domain: $[-3, 3]$
2. Range: $[-4, 2]$
3. Increasing: $(0, 3)$
4. Decreasing: $(-3, 0)$
5. Constant: N/A
6. Find the minimum and maximum of the graph:
 Max: 2 Min: -4



Find intervals for the following:

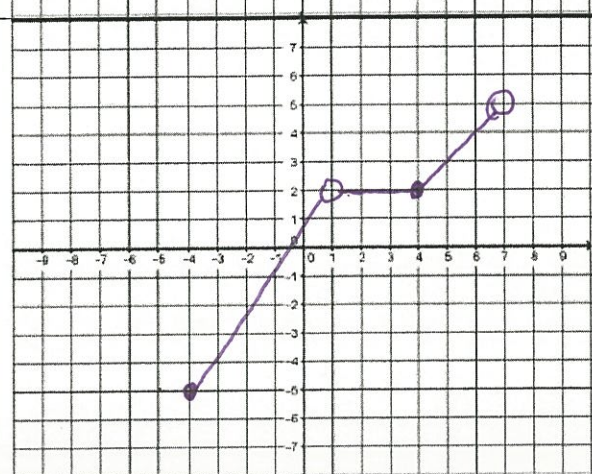
1. Domain: $(-4, 3)$
2. Range: $[1, 5)$
3. Increasing: $(0, 3)$
4. Decreasing: $(-4, 0)$
5. Constant: N/A
6. Find the minimum and maximum of the graph:
 Max: $undefined$ Min: 1



Graph a function given the following features:

- Domain: $[-4, 7)$
- Range: $[-5, 5)$
- $f(2) = 3$
- The function is always increasing.

**Be sure to check that your graph is a function by doing the vertical line test!



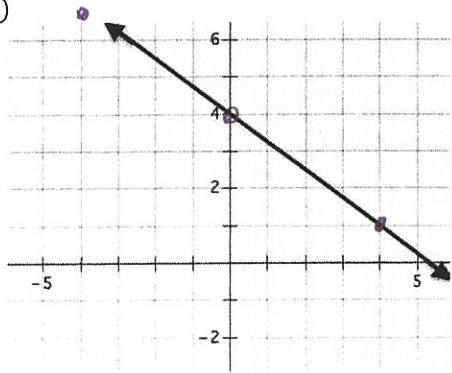
Graph a function given the following features:

- Domain: $[-4, 7)$
- Range: $[-5, 5)$
- The function is undefined at $x = 1$.
- The function is constant on the interval: $(1, 4]$

**Be sure to check that your graph is a function by doing the vertical line test!

Use the graph of each function provided to find the values indicated.

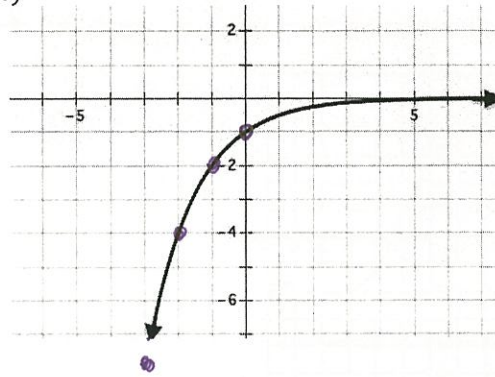
1. $f(x)$



a. $f(4) = 1$ b. $f(-4) = 7$

c. $f(x) = 4, x = 0$ d. $f(x) = 7, x = -4$

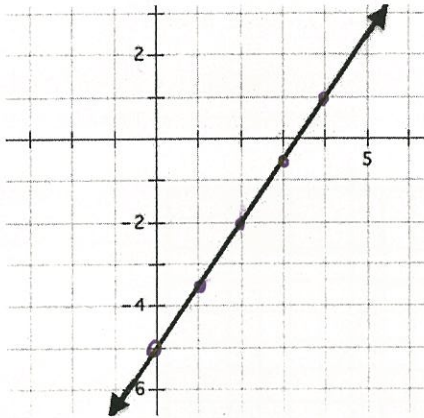
2. $g(x)$



a. $g(-1) = -2$ b. $g(-3) = -8$

c. $g(x) = -4, x = -2$ d. $g(x) = -1, x = 0$

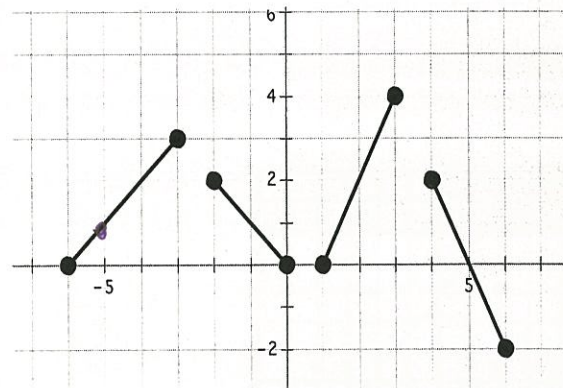
3. $h(x)$



a. $h(0) = -5$ b. $h(3) = 1/2$

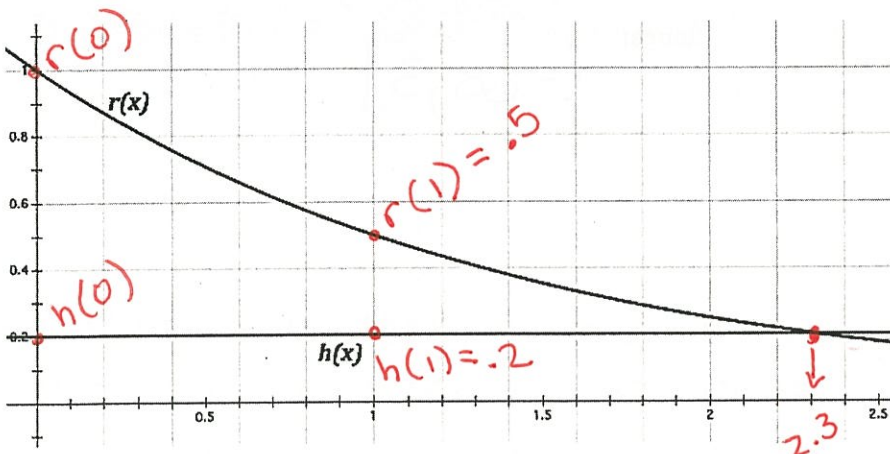
c. $h(x) = 1, x = 2$ d. $h(x) = -2, x = 4$

4. $d(x)$



a. $d(-5) = 1$ b. $d(4) = 2$

c. $d(x) = 4, x = 3$ d. $d(x) = 0, x = -6, 0, 1, 5$



5. Use the graph on the left to answer the following.

- a. Where is $r(x) > h(x)$?
 $(-\infty, 2.3)$
- b. What is $r(1) - h(1)$?
 $0.5 - 0.2 = 0.3$
- c. What is $r(0) + h(0)$?
 $1 + 0.2 = 1.2$