Precalc Warm Up – 10/12/10

Name:_____ Period:_____

1) What does it mean to say a function is increasing?

2) What is an interval?

3) What is an asymptote?

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Precalc
Prep for Q1 Interim

Name:_____Date:_____Period:_____

Q1 Objectives

First Mastery Check 8/27

1) Students will be able to determine if a function is strictly increasing, decreasing or neither
2) Students will be able to translate between verbal descriptions and interval notation (and vice versa)
3) Students will be able to identify intervals on which functions are increasing and decreasing (by graph)

Second Mastery Check 9/8

4) Students will be able to turn a verbal model relating two quantities into a graph (for a linear relationship).

Third Mastery Check 9/22

5) Students will be able to find the average rate of change of a function given a graph, a table and an equation.
6) Students will be able to analyze multiple data sets representing real world phenomena graphed on one graph.
7) Students will be able to determine if a function is increasing/decreasing from its graph and positive/negative from its graph and equation.
8) Students will be able to solve rate problems including problems with multiple rates.

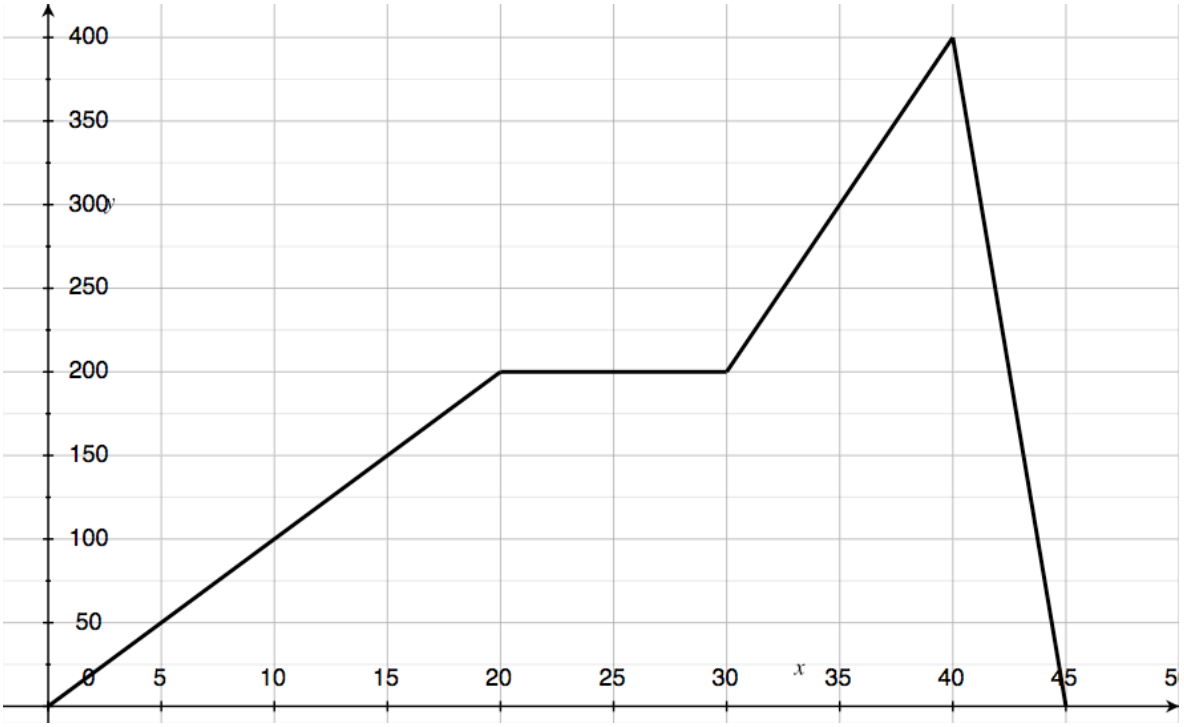
Fourth Mastery Check 10/6

9) Students will know the meaning of a negative exponent and will be able to evaluate an expression with a negative exponent.
10) Students will be able to graph an exponential function (including negative values of x) by creating a table and plotting points.
11) Students will be able to identify asymptotes for exponential functions.
12) Students will be able to turn a verbal model of an exponential function into an equation and graph.

MULTIPE CHOICE

Use the following model and graph to answer question 1) – 3)

Ms. Keaton keeps track of the number of students in the cafeteria in the morning and makes a graph. The x-axis represents the number of minutes after 7: 30 AM and the y-axis represents the number of students in the cafeteria. For questions 1)- 3)



1) Over which interval is the number of students increasing?
   a) $20 \leq x \leq 30$
   b) $40 < x < 45$
   c) $30 < x < 40$
   d) $25 < x < 30$

2) How many students are in the cafeteria at 7:45 AM?
   a) 150
   b) 0
   c) 50
   d) 400

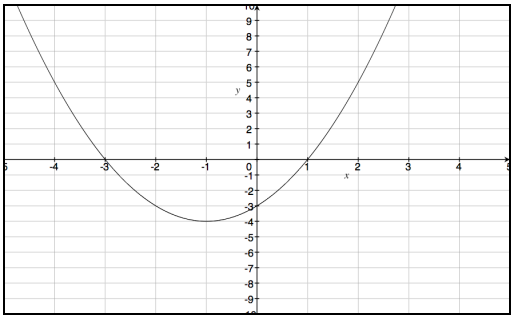
3) Which of the following statements is true?
   a) The cafeteria has the most students in it at 8 AM

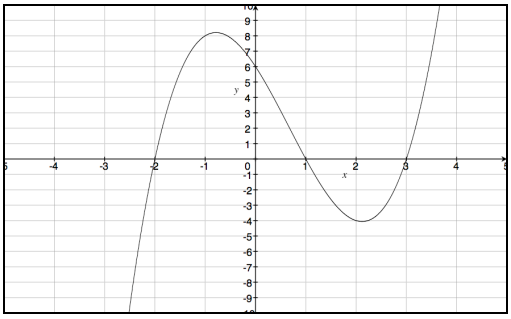
   b) The number of students in the cafeteria increases and then decreases.

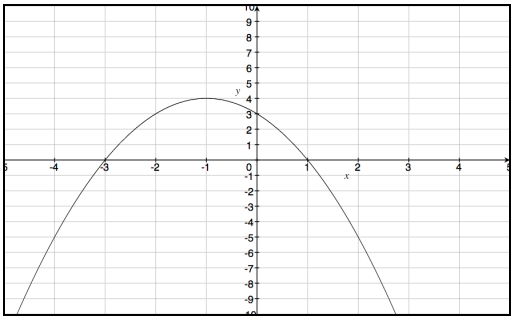
   c) The number of students in the cafeteria doesn't change between x=25 and x=35

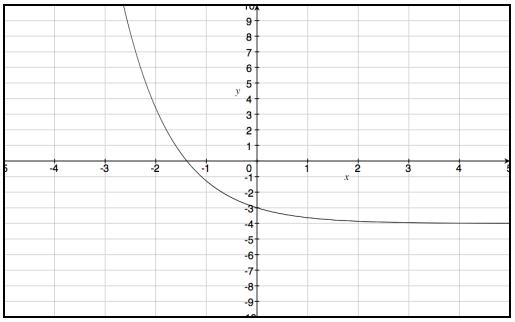
   d) The increase in students in the cafeteria is greatest between x=30 and x=40.

4) Which of the following graphs could represent a function that has the following characteristics:
a y-intercept of -3
x-intercepts of -3 and 1
the function increases for x>-1
the function decreases for x<-1

a) 

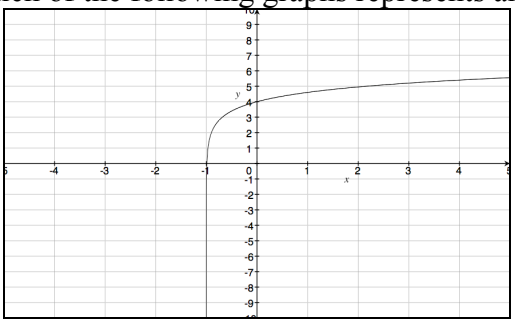
b) 

c) 

d) 

5) Which of the following graphs represents an exponential function?

a)



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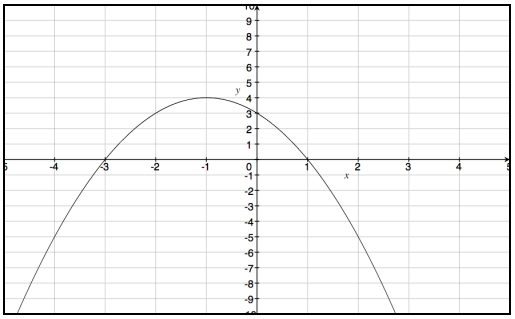
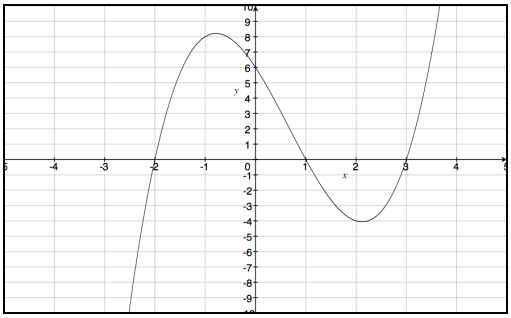
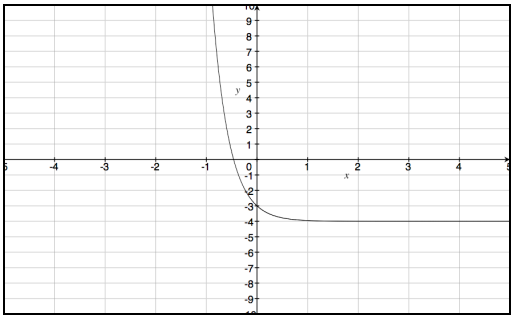


c)

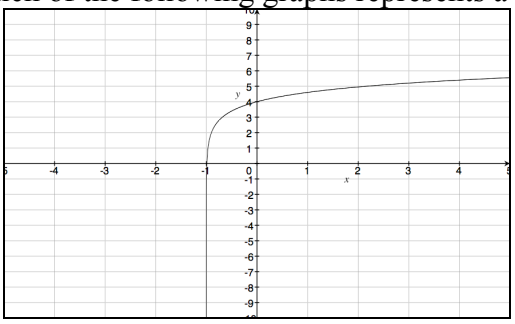


d)



6) Which of the following graphs represents a quadratic function?

a)



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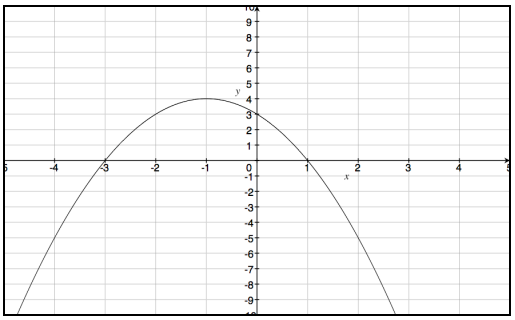

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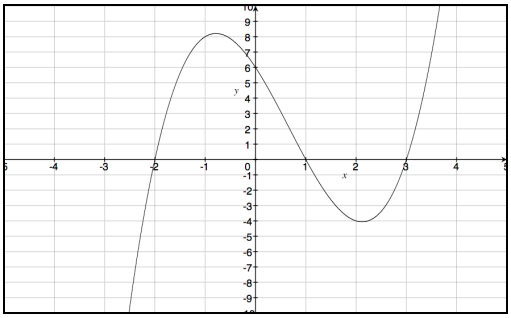
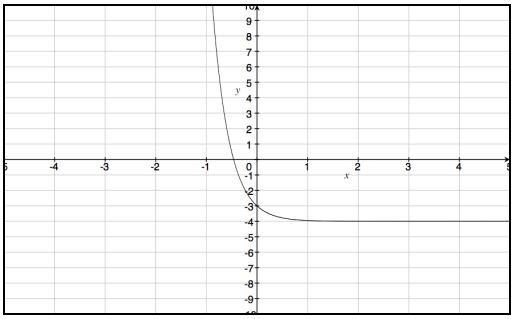
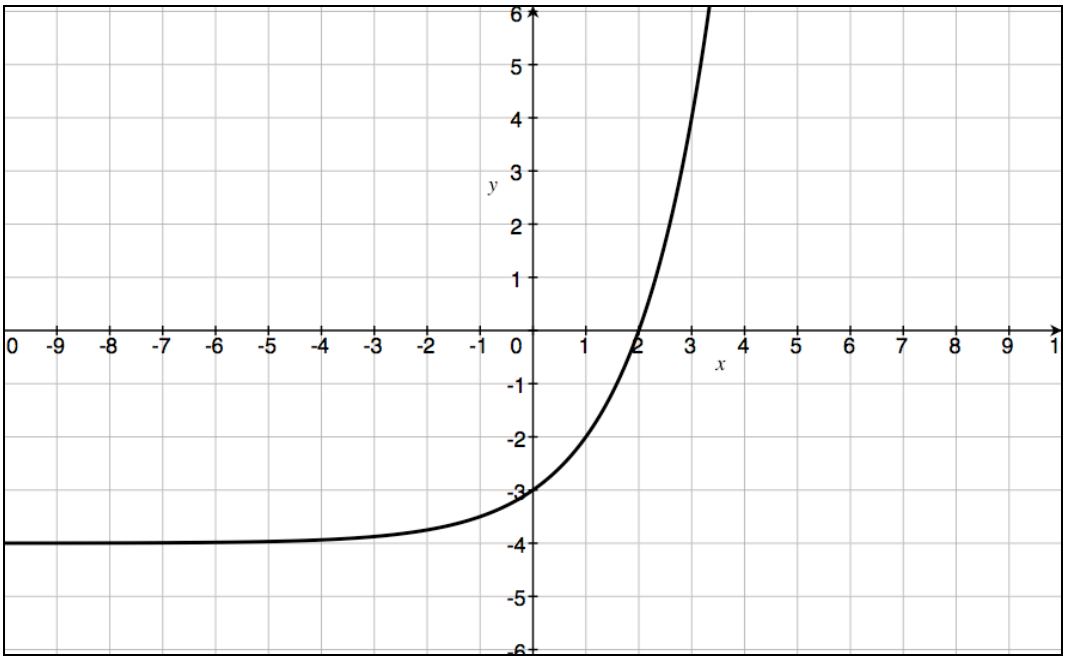


d)



7) Choose the algebraic representations that matches the following graph:



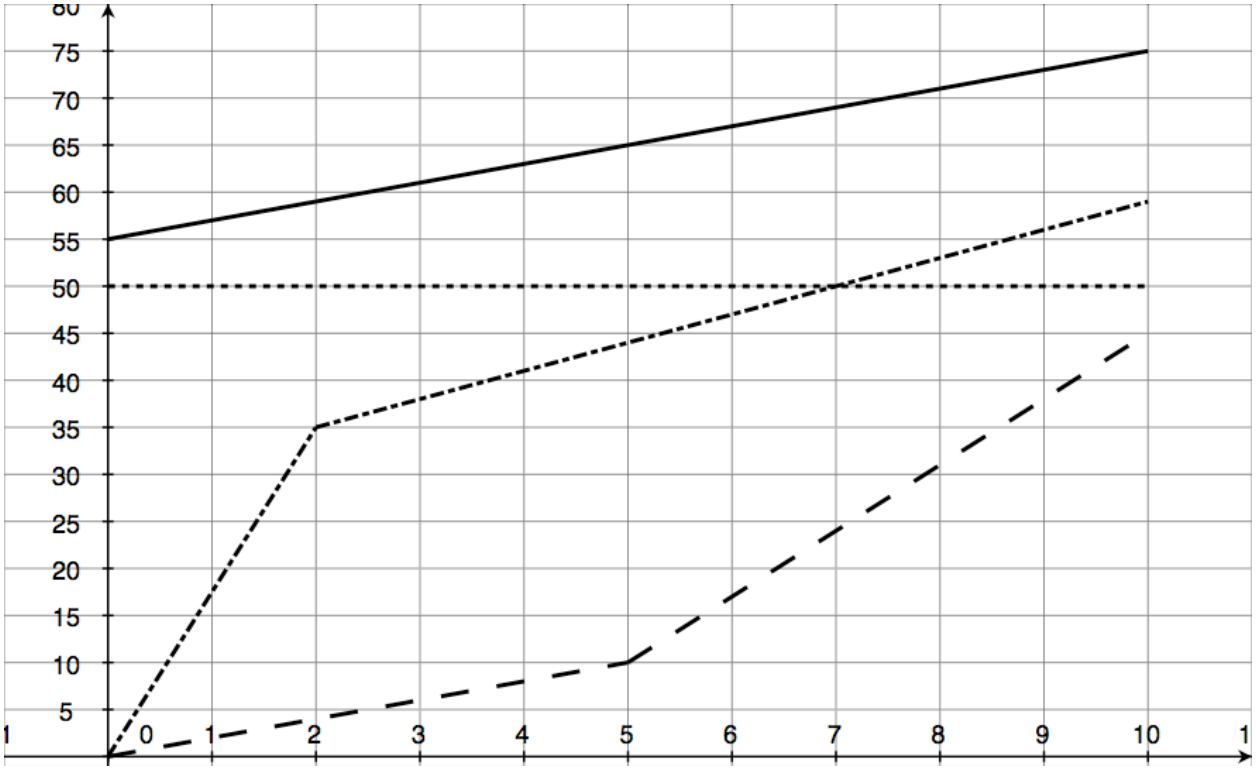
a) $f(x) = x^2 - 4$

b) $f(x) = \log(2x)$

c) $f(x) = \dfrac{x^2}{x-4}$

d) $f(x) = 2^x - 4$

The following graph represents the total number of candy bars sold by four different seniors over 11 days (Day 0 to Day 10). For example, at the end of day 5 Senior 1 sold a total of 65 candy bars. Use the graph to answer questions 8) – 10)



8) Which senior sold candy bars at the fastest rate from day 5 to day 10?

   a) Senior 1

   b) Senior 2

   c) Senior 3

   d) Senior 4

9) Which senior sold candy bars at the fastest rate over the entire 11 days (day 0 to day 10)?

   a) Senior 1

   b) Senior 2

   c) Senior 3

   d) Senior 4

10) Which senior sold the most candy bars from the end of day1 to the end of day2?

a) Senior 1

b) Senior 2

c) Senior 3

d) Senior 4

11) Mr. Monte-Sano plays basketball in the alley with Karim. Karim gives Mr. Monte-Sano a 24 basket head start. Karim scores 7 baskets per minute while Mr. Monte-Sano scores only 3 baskets per minute. How many minutes will it take until Karim and Mr. Monte-Sano have the same number of baskets?

a) 6 minutes

b) 3.4 minutes

c) 8 minutes

d) 2.4 minutes

12) Mr. Spears and Mr. McCarty walk in opposite directions. Mr.Spears walks at 4 miles per hour while Mr. McCarty walks at 3 miles per hour. How far apart are Spears and McCarty if they walk for 45 minutes?

a) 5.25 miles

b) 7 miles

c) 8 miles

d) 5 miles

13) Ms. Enrich grows bacteria in a science class. She starts with one cell and after 1 hour it doubles. Which function describes the growth of the bacteria?

a) $f(x) = 2x$

b) $f(x) = \frac{x}{2}$

c) $f(x) = 2^x$

d) $f(x) = x^2$

14) The following table represents the input and outputs for a function. What type of function does the table represent?

x	$f(x)$
2	8
3	11
4	14
5	17
6	20

a) Exponential

b) Polynomial

c) Logarithmic

d) Linear

15) The following table represents the input and outputs for a function. What type of function does the table represent?

x	$f(x)$
1	2
2	4
3	8
4	16
5	32

a) Exponential

b) Polynomial

c) Logarithmic

d) Linear

16) Consider the function $f(x) = 4(3^x)$ What type of function does $f(x)$ represent?

a) Exponential

b) Polynomial

c) Logarithmic

d) Linear

17) Consider the function $f(x) = x^3 - x^2 + 5x - 3$ What type of function does $f(x)$ represent?

a) Exponential

b) Polynomial

c) Logarithmic

d) Linear

18) The relationship between your years of experience at a job and your salary is modeled by the function $f(x) = 30{,}000(1.04^x)$ where x is your number of years you have been working at the job. What does $f(x)$ represent when x=0?

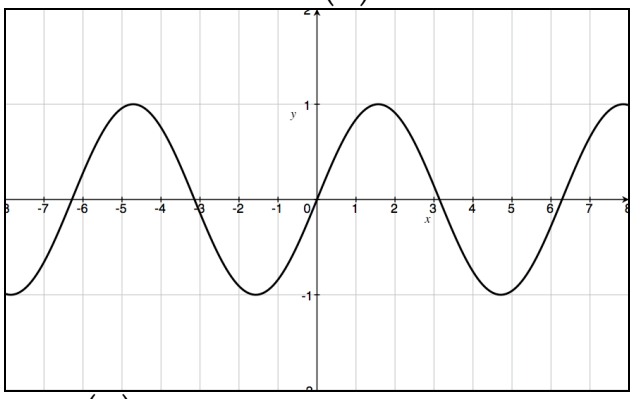
a) The year in which you earn $0

b) Your salary in year 0

c) The year you get a raise

d) Your salary for the year in which you get no increase in salary

19) Consider the graph of $f(x)$ shown below. Which of the following statements is true?



a) $f(x)$ is negative when x=2

b) $f(x) = 0$ when x=2

c) $f(x)$ is increasing when x=2

d) $f(x)$ is decreasing when x=2

20) Which of the following statements about $f(x) = 3^x - 2$ is true when x=0?

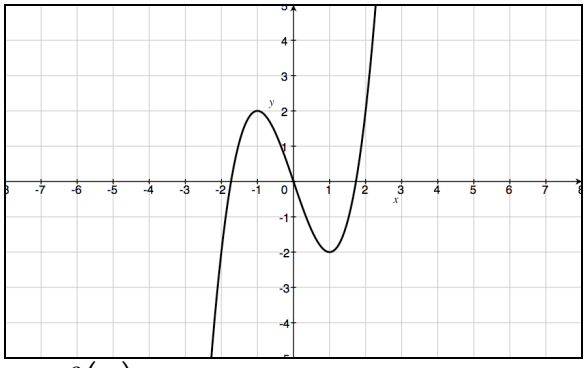
a) $f(x)$ is increasing

b) $f(x)$ is decreasing

c) $f(x)$ is positive

d) $f(x)$ does not exist

21) Consider the graph of $f(x)$ shown below. Which of the following statements is true when x=-2?



a) $f(x)$ is positive and increasing

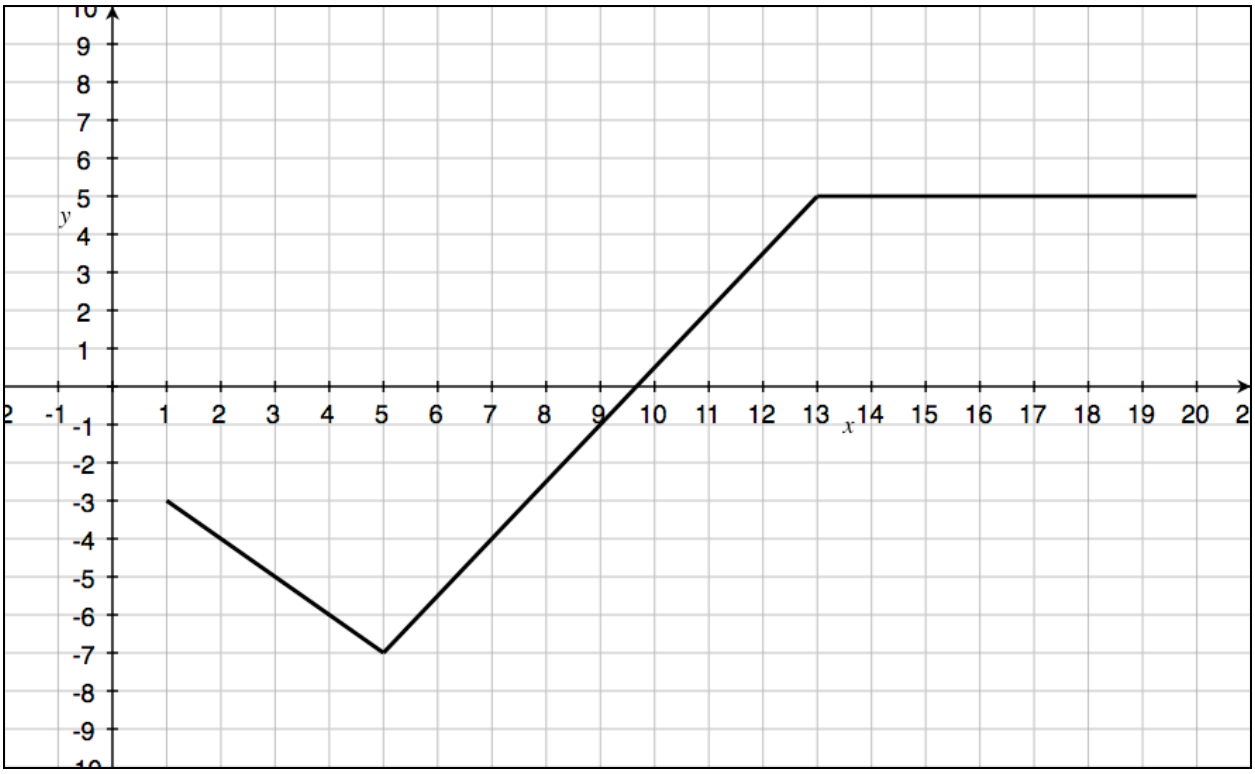
b) $f(x)$ is positive and decreasing

c) $f(x)$ is negative and increasing

d) $f(x)$ is negative and decreasing

BRIEF CONSTRUCTED RESPONSE

1) Mr. Monte-Sano graphs the citizenship points earned by his precalculus class and graphs the result. The day of the quarter is graphed on the x-axis and the total number of citizenship points earned by the class is graphed on the y-axis.



a) At what rate does the precalculus class earn citizenship points from day 5 to day 13?

b) What is the average rate that the class earns citizenship points from day 1 to day 20?

c) Over what interval does the number of citizenship points decrease?

2) Mr. Leonard really, really likes to drink coffee but it gets cold while he teaches Because Leonard likes his coffee to be warm, between classes he heats his cup of coffee to 100 degrees Fahrenheit using the microwave.

a) Leonard asks you to sketch a reasonable graph of the temperature of his coffee during his 50-minute class after heating it. Sketch you graph for Leonard on the following axes. Remember that you must choose scale and label each axis.

b) What kind of function did you sketch?

c) What did you assume is the temperature of Leonard's coffee at minute 0? Why did you make that assumption?

d) Is the rate of change of the temperature of the coffee positive or negative? Why?