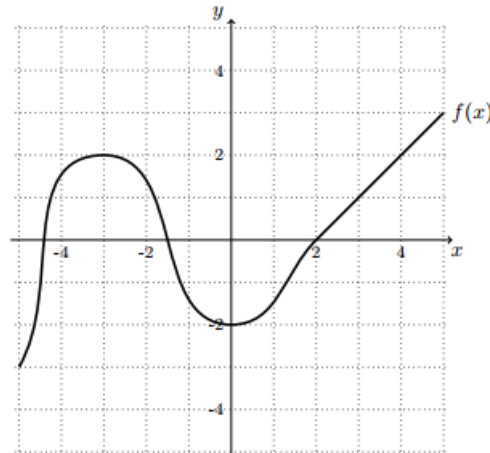


Math 105, Section 052 - Quiz 5
Date: 2/8/18

Name: _____

Write legibly, show work and indicate your final answers. No books, notes, etc. are permitted. This is double sided. Good luck!

1. A portion of the graph of $y = f(x)$ is given below. **You do not need to show any work for this problem.**



- (a) For which values of x must $f(x)$ be decreasing? Use only the information provided in the graph above, and write your answer *in the space provided, using inequalities or interval notation*

$f(x)$ is decreasing on _____

- (b) Let $g(x) = f(x + 5) - 8$. For which values of x must $g(x)$ be decreasing? Use only the information provided in the graph above, and write your answer *in the space provided, using inequalities or interval notation*.

$g(x)$ is decreasing on _____

- (c) On which of the following intervals is the average rate of change of $f(x)$ the greatest? On which of the following intervals is it the least? Write your answers *in the spaces provided*. (Note: *greatest and least* do **not** mean largest and smallest in absolute value.)

$[-4, -1.5]$ $[-3, 0]$ $[-4, 4]$ $[2, 4]$ $[-5, 5]$

The average rate of change is the greatest on _____, and the least on _____

- (d) The line $y = 7$ is a horizontal asymptote for the graph $y = f(x)$ (note that this is not shown in the graph above). Find the equation(s) of the horizontal asymptote(s) of the graph of $y = f(x - 10) + 4$ and write your answer(s) in the space provided, or **circle "NO HORIZONTAL ASYMPTOTES"**

Horizontal asymptote(s): _____

NO HORIZONTAL ASYMPTOTES

2. There are $T(d)$ termites in an abandoned house on day d . Starting at $d = 0$, the population of termites increases by 30% each day, and reaches of a peak of 28,561 termites at $d = 4$. Starting at $d = 4$, the termite population declines at a constant rate, up until $d = 8$ when there are no termites left. Write a *piecewise-defined* formula for $T(d)$ in terms of d in the spaces provided. Keep your answers in **exact form**.

$$T(d) = \begin{cases} \underline{\hspace{2cm}} & \text{if } \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} & \text{if } \underline{\hspace{2cm}} \end{cases}$$

3. The termites at the abandoned house have begun attracting birds. The number of birds B , along with the temperature T (in °F) and the wind speed W in (miles per hour) have been recorded at various times h , where h is measured in hours after 8 am on October 10th.

h	0	1	2	3	4	5
B	10	11	15	13	11	5
T	30	33	40	39	33	31
W	14	10	13	12	11	10

Based on the table above, which of the following statements *could* be true about h , B , T , and W ?

Circle all that apply

B is a function of T T is a function of B W is a function of B

B is a function of W h is a function of T W is a function of T