University of Georgia   **Math 1113**
Department of Mathematics   **Test 1**   Fall 2016

By providing my signature below I acknowledge that this is my work, and I did not get any help from anyone else:

Name (sign): _____   Name (print): _____

Student Number: _____

Instructor's Name: _____   Meeting Time: _____

Problem Number	Points Possible	Points Made
1	30	
2	10	
3	15	
4	10	
5	10	
6	15	
7	10	
Total:	100	

- If you need extra space use the last page.

- Please show your work. **An unjustified answer may receive little or no credit.**

- Your work must be **neat**. If I can't read it (or can't find it), I can't grade it.

- The total number of possible points that is assigned for each problem is shown here. The number of points for each subproblem is shown within the exam.

- Please turn off your mobile phone.

- You are only allowed to use a TI-30 calculator. No other calculators are permitted.

A

1. Answer each question below. For each question the following points in the coordinate plane are defined to be

$$
\begin{aligned}
P &= P(1,5), \\
Q &= Q(-3,6), \\
R &= R(2,8).
\end{aligned}
$$

(a) [10 pts] What is the distance between P and R?

(b) [10 pts] What is the distance between P and the point half way between Q and R?

(c) [10 pts] What is the formula for the line that goes through P and is perpendicular to the line that goes through Q and R?

2. [10 pts] Determine the range and domain of the function

$$f(x) \;=\; \sqrt{3-x}.$$

3. Answer each of the questions below. The graph of the function, $f(x)$, is given in the plot below.

Graph of the Function f
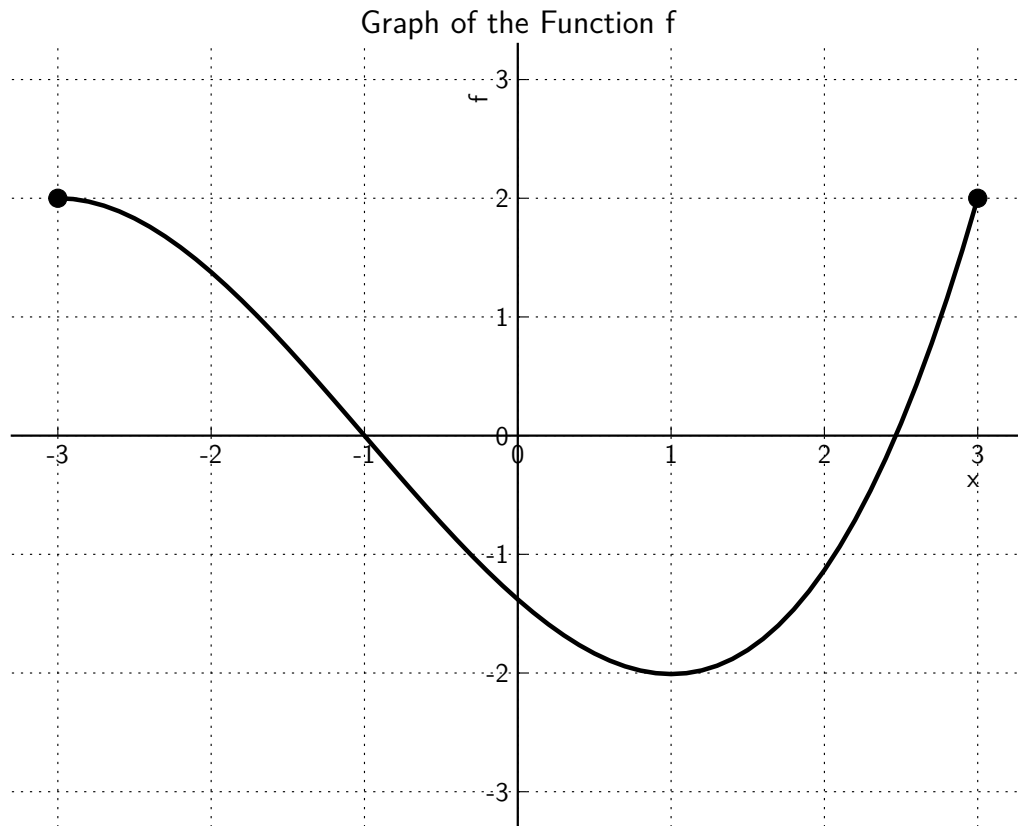
(a) [8 pts] Determine the range and domain of the function.

(b) [5 pts] Determine the values of x for which the function is increasing.

(c) [2 pts] Determine the values of x where the function has a maximum or a minimum.

Points earned: _____
out of a possible 0 points

4. [10 pts] Determine the formula for a parabola that has one of its x intercepts at $x = 3.5$, and its maximum value is $y = 2$ at $x = 5$. Your answer can be in either vertex form or in the form $y = ax^2 + bx + c$.

5. The equation for a circle is given by

$$x^2 + 6x + y^2 - 2y \ = \ 3.$$

(a) [6 pts] Determine the center and radius of the circle.

(b) [4 pts] Determine the equation for the circle if it is shifted up 2 units and shifted left 4 units.

6. [15 pts] Farmer Luigi wants to hold a circus in one of his fields to make a little extra money. He will mark off a rectangle in one of his fields. The the rectangle will be lined with tinsel, and he has 75 meters of red tinsel that was purchased at the discount tinsel store. What dimensions for the rectangle will maximize the area of the rectangle? Show all of your work, and justify your conclusions.

Points earned: _____
out of a possible 0 points

7. A park has a population of large predators that feed on a small prey animal. The function f represents the number of predators given the number of prey in the park, and the function is a linear function. Provide short answers (one to two sentences) for each question below including an explanation why your answer is correct.

(a) [5 pts] Should the slope be positive, zero, or negative? Why?

(b) [5 pts] Should the y-intercept be positive, zero, or negative? Why?

Points earned: _____
out of a possible 0 points

Extra space for work. If you want us to consider the work on this page you should write your name, instructor and meeting time below.

Name (print): _____ Instructor: Name (print): _____ Time: _____

Points earned: _____
out of a possible 0 points