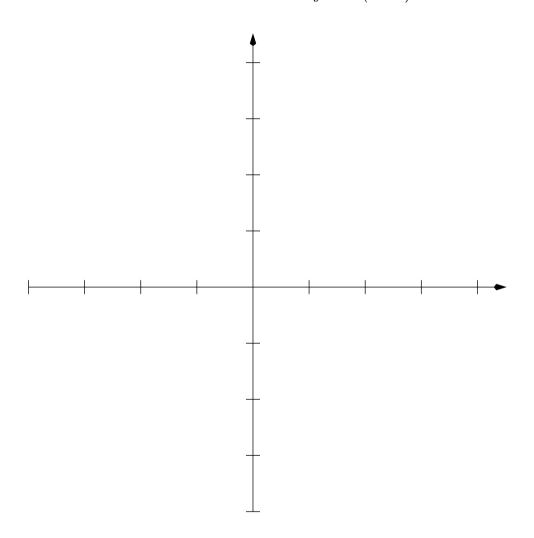
## MAT112 Test 1: Chapters 1 and 2

## Name:

**Directions**: Show your work! Answers without justification will likely result in few points. Your written work also allows me the option of giving you partial credit in the event of an incorrect final answer (but good reasoning). Indicate clearly your answer to each problem (e.g., put a box around it). **Good luck!** 

**Problem 1** (10 pts) On the axes below, graph the following equations and clearly indicate which is which:

- 1. y = x
- 2. y = x 1
- 3. y = 2(x-1)
- 4. y = -2(x-1)
- 5. y = -2(x-1) 2



**Problem 2** (10 pts). A rental property costs \$500 up front, and \$350 per day.

• Write a linear cost function for this situation.

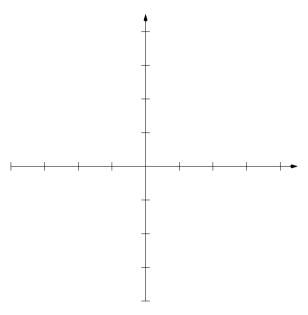
- What does the slope represent?
- What does the y-intercept represent?
- Does the x-intercept have meaning in this problem?

**Problem 3** (10 pts). Consider  $f(x) = \sqrt{4-x^2}$ 

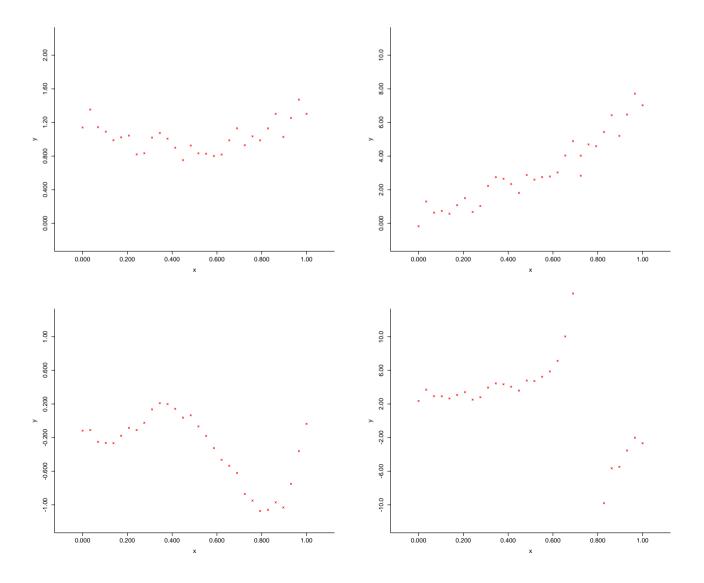
• What is the domain of f? What is its range?

• f is a composition of functions. Describe f as a composition of functions, either verbally or by actually writing the functions of which f is composed.

**Problem 4** (10 pts). Graph the function  $f(x) = 2x^2 - 3x - 6$ , carefully indicating the vertex, axis of symmetry, roots (i.e. x-intercepts), and y-intercept. What is its graph called?



**Problem 5** (10 pts). Consider the following graphs: in each case, how might you model the data? That is, what <u>kinds</u> of functions would you consider using as models, and why? Which would you not consider? Write your answer on each graph.



**Problem 6** (10 pts). Solve the following:

• 
$$3^x = \frac{1}{81}$$

• 
$$3^x = 9^{2x-1}$$

• Find 
$$\log_7(49)$$

**Problem 7** (10 pts).

• Write  $\log_{10} x = 6$  as an exponential equation, and solve it.

• Solve:  $e^{x-1} = 3$  for x.

<b>Problem 8</b> (10 pts). You have \$10000 to invest, and two options: $6\%$ quarterly, or $5.9\%$ continuously.
• Which investment will give the best return? Explain!
• Suppose you go with the continous compounding: how long will it take your investment to double?