

Algebra and Calculus Worksheet: Recitation 3 (9-28-15)

Name: _____

1. **Section 1.8: Question 39**

Solve the inequality, express the solution in interval notation, and then graph the solution set:

$$x(2x + 7) \geq 0$$

2. **Section 1.8: Question 59**

Solve the nonlinear inequality $\frac{x-3}{x+1} \geq 0$, express the solution using interval notation, and then graph the solution set.

3. **Section 1.8: Question 63** Solve the nonlinear inequality $\frac{2x+1}{x-5} \leq 3$, express the solution using interval notation, and then graph the solution set.

4. Find the equation of a line with slope 3 whose x-intercept is 3. What is the y-intercept?

5. Do the lines $y = 3x + 7$ and $y - 7 = 3(x - 4)$ intersect? If so, where? If not, why not?

6. Do the lines $y = 3x + 7$ and $y - 13 = 3(x - 2)$ intersect? If so, where? If not, why not?

7. Sketch the function $f(x) = (x - 1)^2(x + 2)$

8. Consider the following two graphs:

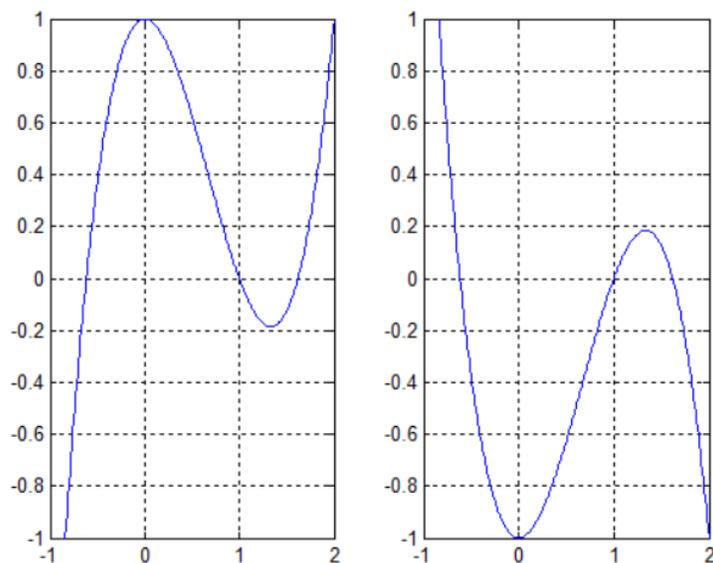


Figure 1: Some graphs of functions.

- Can you guess what kind of polynomials these are? (linear? quadratic? cubic? quartic? higher powers?). Assume the polynomials continue in the same direction beyond the edges of the box.
- Where are the maxima and minima of these functions? Where are the functions increasing and decreasing?
- Can you tell how the two functions are related to each other?

9. Find the domain of the following functions

- $f(x) = 1 - \sqrt{2x}$
- $f(x) = \sqrt{1 - 2x}$
- $f(x) = \frac{1}{\sqrt{1-2x}}$
- $f(x) = \frac{1}{\sqrt{2x-1}}$

10. Listed for each question below are two quantities. One is the input for a function, and the other is the output for the function.

- Identify which should be the input and which should be the output.
- Consider what the corresponding graph might look like.

- the cost to ship a package; the weight of a package
- the time of year; the average daily temperature in New York
- the probability you decide to go fishing today; the distance you live from a large body of water