

Math 103: College Algebra and Trigonometry

Homework assignment 2 (10 points)

Assigned Tuesday, 23 September 2008

Due Tuesday, 30 September 2008

Problem 1. Evaluate the following.

- (a) $(-3)^2$ (b) $-(3^2)$ (c) -3^2 (d) $\sqrt{16}$ (e) $\sqrt{(-2008)^2}$ (f) $\sqrt[7]{-128}$ (g) $(\sqrt[3]{-42})^3$

Problem 2. Simplify

$$\frac{3x^2 - 12}{3x^2 - 12x + 12}.$$

Problem 3. Decide whether each of the following statements is true or false. Justify your answers.

- (a) For all real numbers x , $\sqrt{x^2} = x$.
- (b) Let $f(x) = ax^2 + bx + c$, where a , b , and c are real numbers and $a \neq 0$. If $b^2 - 4ac < 0$, then the graph of $f(x)$ has no x -intercepts.
- (c) The expression $4x^3 - 3.6x^2 - \sqrt{2}$ is a polynomial.
- (d) The graph of a polynomial function sometimes has a hole.
- (e) The graph of a rational function sometimes has a hole.

Problem 4.

- (a) Find a function $f(x)$ which is both even *and* odd, or explain why such a function cannot exist.
- (b) Find a function $g(x)$ whose graph is exactly the same as the graph of the function $h(x) = x + 1$, except that the graph of $g(x)$ has a hole at $x = 2$. [Hint: You will probably want to make $g(x)$ a rational function.] What is the domain of your function $g(x)$?

Problem 5. Find a degree-7 polynomial function which has the greatest possible number of turning points. Give the coordinates for each of the turning points (approximations are okay) and say whether each is a local maximum or a local minimum. (You may want to experiment with several functions on your graphing calculator to find one that works.)

Problems from the textbook

Section 4.3, #21, 28, 39, 46

4.4, #9

5.1, #36, 38, 46

5.2, #16, 43, 44, 45, 54

5.3, #35, 55 [an approximation is okay for part (b)]

5.4, #11, 23

5.5, #28 [ignore Descartes' rule of signs], 49, 62, 92, 112