

## Math-08 Homework #13

### Reading

- Text book section 3.3, 3.4, 4.1

### Problems

Note that all sketches of graphs must have all found intercepts and discontinuities labeled. All domains and ranges must be expressed in interval notation. Remember, sketches do not have to be to scale!

1). Let  $p(x)$  be a polynomial whose graph contains the points  $(-2, 1)$  and  $(3, 0)$ .

- a). What is the remainder with  $p(x)$  is divided by  $(x + 2)$ ?
- b). What is the remainder with  $p(x)$  is divided by  $(x - 3)$ ?

2). Let:

$$p(x) = 2x^4 + x^3 - 9x^2 + 8x - 2$$

- a). Fully factor  $p(x)$ . Note that you may end up with irrational zeros! You must show all work, including the possible candidates for zeros, and long (or synthetic) divisions that lead you to the final answer. There is *no* credit for simply stating an answer.
- b). Determine all x-intercepts (if any).
- c). Determine all y-intercepts (if any).
- d). Sketch the graph. Be sure to label all intercepts.
- e). Use a calculator to determine all extrema. Just state the points; you don't need to attach screenshots this time.

3). Consider a circle:  $x^2 + y^2 = r^2$ .

- a). Solve for  $y$ .
- b). Limit the range so that you get a function of  $x$ .
- c). Limit the domain so that you get a one-to-one function of  $x$ .
- d). Determine the inverse function based on your limited domain by solving for  $x$ .

4). Consider a function  $f(x)$  whose graph contains the following points:

x	-5	-3	0	1	-2
y	1	-1	-3	-2	6

Evaluate the following:

$$2f^{-1}(-2) - f(-3) + [f(1)]^{-1}$$