5.2 Practice Problems

1. Find the remainder if $f(x)=x^3+3x^2-x-3$ is divided by   a) $x+2$ b) $x-1$

2. Use the factor theorem to determine whether the function $f(x)=x^3+6x^2+8x-6$ has the factor
    a) $x+2$ b) $x-1$

3. Find the bounds to the zeros of each polynomial function.
a) $f(x)=x^3-5x^2-11x+11$ b) $f(x)=3x^3-2x^2+x+4$

4. Use the intermediate value theorem to show that polynomial function has a zero in the given interval.

$$f(x)=x^4+8x^3-x^2+2; \quad [-1,0]$$

5. Find the real zeros of the polynomial function $f(x)=x^3+3x^2-2x-6$
   a) the function f has at most _____ zeros.

   b) List the potential zeros using the rational zero theorem.

   c) Use a graphing utility to narrow your list of potential zeros.

   d) Use the factor theorem to determine if the potential rational zero is a zero.

   e) If you find a zero, use synthetic division or long division to factor the polynomial.

   f) Repeat until all of the zeros have been identified and the polynomial function is completely factored.