In-Class Problems 12 for Monday, March 12

These problems are from Pre-Class Problems 12.

1. Use synthetic division to divide the following polynomials.

   a. $(2x^3 - 7x^2 + 15x - 20) \div (x + 3)$ b. $\dfrac{x^3 - 125}{x - 5}$

2. If $f(x) = x^4 + 6x^2 - 9x + 12$, then use the Remainder Theorem to find the following polynomial values.

   a. $f(-5)$ b. $f(8)$ c. $f(4i)$

3. If $g(x) = 6x^4 - 11x^3 - 53x^2 + 108x - 36$, then use the Remainder Theorem to determine if the given number is a zero (root) of the polynomial.

   a. -3 b. 3 c. $\dfrac{3}{2}$

4. If $h(x) = 3x^4 + 8x^3 + 44x - 80$, then use the Factor Theorem to determine if the given binomial is a factor of the polynomial.

   a. $x - 2$ b. $x + 4$ c. $x - \dfrac{1}{3}$

5. Find the zeros (roots) of the following polynomials. Also, give a factorization for the polynomial.

   a. $f(x) = 3x^4 - 7x^3 - 20x^2 + 30x + 36$

   b. $g(x) = 2x^4 - 8x^3 + 15x^2 - 28x + 28$