PROBLEM SET 6-6

(The Fundamental Theorem of Algebra)

For each equation, state the number of complex roots, the possible number of real roots and the possible number of rational roots.

1. $x^3 + 4x^2 + 5x - 1 = 0$

2. $x^7 - x^3 - 2x - 3 = 0$

3. $x^{10} + x^8 - x^4 + 3x^2 - x + 1 = 0$

4. $2x^4 - x^3 + 2x^2 + 5x - 26 = 0$

Find all the zeros of each function.

5. $f(x) = 2x^3 + x^2 + 1$

6. $g(x) = x^3 - 5x^2 + 5x - 4$

7. $y = x^4 - 6x^2 + 8$

8. $y = x^3 - 3x^2 - 9x$

9. $y = x^3 - 4x^2 + 9x - 36$

10. $y = 2x^3 + 14x^2 + 13x + 6$

11. $g(x) = 2x^3 - x^2 + 40x - 20$

12. $f(x) = 15x^3 - x^2 + 3x - 2$