MAT 171 Section 3.4 Homework **Name:**_____

Use the Rational Zero Theorem to list all possible rational zeros for each given function.

1. $f(x) = x^3 + x^2 - 4x - 4$

2. $f(x) = 3x^4 - 11x^3 - x^2 + 19x + 6$

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

For the next problems, (a) List all possible rational zeros; (b) Use synthetic division to test the possible rational zeros and find an actual zero; (c) Use the quotient from part (b) to find the remaining zeros of the polynomial function.

4. $f(x) = 2x^3 - 3x^2 - 11x + 6$

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

6. $f(x) = xx^3 + 6x^2 + 5x + 2$

7. $f(x) = x^3 - 10x - 12$

8. $f(x) = 6x^3 + 25x^2 - 24x + 5$

9. $f(x) = x^4 - 2x^3 - 5x^2 + 8x + 4$

Find an n-th degree polynomial function with real coefficients satisfying the given conditions.

10. $n = 3$; 1 and $5i$ are zeros; $f(-1) = -104$

11. $n = 3$; -5 and $4 + 3i$ are zeros; $f(2) = 91$

12. $n = 4$; i and $3i$ are zeros; $f(-1) = 20$

Find all zeros of the polynomial function or solve the given polynomial equation. Then write the function equation in factored form

13. $2x^3 - x^2 - 9x - 4 = 0$

14. $f(x) = x^4 - 2x^3 + x^2 + 12x + 8$