Show work for all problems; use the back of the sheet if necessary.

1. **(3 points)** Using long division, find the quotient and remainder of the division $\frac{6x^3+2x^2-22}{x^2-5}$. Label which is which.

2. **(6 points)** Find all the rational zeroes of the polynomial $x^3 - 2x^2 - 7x - 4$.

3. **(4 points)** Perform the division $\frac{5-i}{3+4i}$ and write the result in the form $a + bi$.

4. **(7 points)** Find the y-intercept, x-intercepts (a.k.a. zeroes), vertical asymptotes, and long-term behavior (a.k.a. nonvertical asymptotes) of the function $f(x) = \frac{2x}{(x-1)(x-4)}$. Label which is which.