1. (3 pts) Find and simplify a polynomial of lowest degree with rational coefficients that has $1 + \sqrt{2}$ and $1 - 2i$ as some of its zeros.

2. (5 pts) Solve: $4x^3 - 2x^2 - 30x \leq 0$
3. (5 pts) Solve: \[
\frac{3x - 7}{6x^2 - 5x - 4} \geq 0
\]
4. Consider the following polynomial:

\[ P(x) = 4x^6 + 4x^5 + 21x^4 + 38x^3 - 130x^2 + 18x + 45 \]

(a) (1 pt) Use the Rational Zero Theorem to list all POSSIBLE rational zeros.

(b) (2 pts) Using synthetic division, show that \( x = -\frac{5}{2} \) is a zero of \( P \)

(c) (6 pts) Find all other zeros of \( P \). Use the back of this sheet, if needed. You must show all work. Answers without work will receive no credit.