**Problem 1.** Let $f$ be a function given by

$$f(x) = x^3 - 10x + 9.$$

**(a)** Find the zeros of $f$. (Hint: first note that $f(1) = 0$.)

**(b)** Write an equation of the line tangent to the graph of $f$ at $x = -1$.

**(c)** Find the number $c \in (a, b)$ such that

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

on the closed interval $[a, b] = [1, 3]$.

**Problem 2.** Let
$$f(x) = x^4 - 13x^2 + 36.$$

(a) Find all zeros of $f$, zeros of $f'$, and zeros of $f''$.

(b) Find the maximal intervals on which $f$ is positive, negative, increasing, decreasing, concave up, or concave down.