(1) (30 pts, 15 pts each) True or false? Circle one.

a) T/F
\[ f(x) = x^4 - 3x^3 + 2x + 6 \] satisfies the conditions of the MVT on the interval \([2, 4]\).

b) T/F
With \( f(x) = 2|x - 6| + 1 \), the conclusion of Rolle’s Theorem for \( f \) on \([4, 8]\) fails.

(2) (30 pts) Find critical numbers and global maximum and minimum values of \( f(x) = x^3 - 3x^2 \) on \([-1, 3]\).
(3) (20 pts) Let an expression $y$ of $x$ be given implicitly by the formula

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

Find $d^2y/dx^2$ by implicit differentiation.

(4) (20 pts) Let $c$ be any constant. Show that

$$x^5 - 2x + c = 0$$

has at most one real solution on $[1, 2]$