1. (10 points) Find $y'(x)$ if $y = 2x^4 - 3x^3 + 5x - 1$. Simplify your final answer.

2. (10 points) Find $y'(x)$ if $y = 3\sqrt[3]{x} + \frac{1}{3\sqrt{x}}$. Simplify your final answer.
3. (10 points) Find $y'(x)$ if $y = \frac{x + 1}{\cos x}$. Simplify your final answer.

4. (10 points) Find $y'(x)$ if $y = (x^4 - x^2 + 1)^3$. Simplify your final answer.

5. (10 points) Find $y'(x)$ if $y = (x^2 - 1)^3 (x^4 + x)^2$. Do not simplify.
6. (10 points) Find $y'(x)$ if $y = \left(\frac{x^2 + 8}{x^3 - 2}\right)^4$. Do not simplify.

7. (10 points) Find $y'(x)$ if $y = \sqrt{\tan(x^2 + x + 1)}$. Do not simplify.

8. (10 points) The edges of a cube are increasing at the rate of 3 cm/min. At what rate is the surface area of the cube increasing when the edges are 6 cm?
9. (10 points) Use a linear approximation to estimate \( \sin 2 \). (Hint: Use \( x_0 = \frac{2\pi}{3} \) as the basis of your approximation.)

10. (10 points) Determine whether the hypotheses of the Mean Value Theorem are satisfied for \( f(x) = x^2 + 3x - 4 \) on the interval \([1, 4]\). If so, find the number \( c \) in the interval ensured by the conclusion of the Mean Value theorem.