

HOMework 5

Due on: October 14 at 2:00pm (submit via Crowdmark).
You can use these exercises as preparation for the midterm.

Question 1. Differentiate the following functions.

(a) $2x^5 - 7x^3 + 2x - 9$

(b) $\frac{x^2}{x^3 + 2}$

(c) $x^2 \cdot \ln x \cdot \sin x$

(d) $\sqrt[5]{x} + \sqrt{e^x + 1}$

(e) $(4^x - x)^{1.4}$

(f) $\cos(\log_3(e^x \sin x))$

Question 2. Let $f(x)$ and $g(x)$ be differentiable functions. Express the derivatives of the following functions using f , g and their derivatives.

(a) $x^3 f(x) - g(x)$

(b) $f(x^3 - g(x))$

Question 3. Find the tangent line to the curve

$$x + \cos x = y^5 + y^4 - 1$$

at the point $(0, 1)$.

Question 4. Consider the curve

$$e^x + 2e^y = xy + 2.$$

Use implicit differentiation to express $\frac{dy}{dx}$ in terms of x and y .