

New West Charter High School -- Calculus BC -- Chapter 3 Part 2 -- 90 points

Be clear and organized in all of your answers. State conclusions if necessary. Show all of your work. Pencils only, please. Simplest answers are best. All problems are ten points.

Find the first derivative as appropriate for each of the following:

1) $y = \frac{8}{\sqrt{16x^2 + 16x + 4}}$

2) $g(t) = \frac{\cot 5t}{2 - t^2}$

3) $P(\varepsilon) = \varepsilon^{2-\varepsilon}$

4) $y = x^{\pi-1} (8^{x^2})$

5) Derive an expression for the derivative of the inverse sine function.

6) Show, using the expansion of e^{2x} , that it is one-half its own derivative.

7) Find the equation for the tangent line to the curve $3xy - xy^2 - 2x = 4$ at the point $(-2, 3)$.

8) Find $\frac{dy}{dx}$ for the parametric $y(t) = \sqrt[3]{t^2 - 1}$ and $x(t) = \sin 2t \tan 2t$

9) Find $\frac{d^2y}{dx^2}$ for $y^2 = x^2 - 2x$ in terms of x only. Simplify.

EXTRA CREDIT - All or Nothing - Five points. (If no one gets it, then first right answer turned in to me with the written solution gets the points - one week time limit.)

9) Find all three positive solutions for x which satisfy

$$(2 + \log_{10} x)^3 + (-1 + \log_{10} x)^3 = (1 + \log_{10} x^2)^3$$