

QUIZ 5

Instructions: Complete the following problems. You may use the derivative shortcuts developed in class to answer these problems, though you are encouraged to show as much work as possible so that partial credit may be awarded.

(1) (10 pts) Evaluate $\frac{d}{dx} [\arcsin(x)]$.

(2) (10 pts) Evaluate $\frac{d}{dx} \left[\sqrt[3]{\arctan(x)} \right]$.

(3) (10 pts) Evaluate $\frac{d}{dx} [x \ln(x) - x]$. Simplify your answer as much as possible.

(4) (10 pts) Evaluate $\frac{d}{dx} [\sin(\sqrt{1+x^2})]$.

(5) (30 pts) Find $\frac{dy}{dx}$ for the graph $2(x^2 + y^2)^2 = 25(x^2 - y^2)$.

- (6) (30 pts) Believe it or not, cubic polynomials in x and y are often used to encrypt information that travels across the web. This lets you and I order calculus books off of Amazon.com without fear that someone will steal our credit card information. One of the steps in the encryption is to find the equation of the line tangent to a given cubic, something we're quite proficient at doing! Here's a problem that asks you to perform this kind of calculation.

Use your calculus skills to find the equation of the line tangent to the graph $x^2 = y^3 + y^2$ at the point $(\sqrt{2}, 1)$.

If you finish early, use this space to list your favorite TV shows today. Compare and contrast these shows with *Full House*, your favorite television show when you were 8.