Math 101- Major Quiz

Sr.: ID: Name: Sec.:

Q 1(3.1): Consider the following curve $f(x) = 1/x$. When does the slope equal to $-1/16$?

Q 2(3.2): Find the derivate of $f(x) = \frac{-x}{x+1}$ at $x = 0$.

Q 3(3.3): Does the curve $y = x^4 - 8x^2 + e$ have any horizontal tangents? If so, find the sum of their x-coordinates.

Q 4(3.4): A dynamite blast blows a heavy rock straight up with a launch velocity of 98 m/sec. It reaches a height of $s = 98t - 4.9t^2$ m after t seconds. How high does the rock go?

Q 5(3.5): Find

$$\lim_{x \to 0} \frac{\sqrt{2 + secx}}{sin(\pi/2 - tanx)}$$

Q 6(3.6): Use the power chain rule to find $\frac{d}{dx}(5x^3 - x^4)^3$ at $x = 1$.

Q 7(3.7): Find dy/dx at the point $P(0, -1)$ if $y^2 = x^2 + cos(xy)$.

Q 8(3.8): A line with slope m passes through the origin and is tangent to the graph of $y = log(x)$. Find m.

Q 9(3.9): Find $\frac{d}{dx} sec(\sqrt{5}x^3)$ at $x = -1$

Q 10(3.10): A police cruiser, approaching a right-angled intersection from the north, is chasing a speeding car that has turned the corner and is now moving straight east. When the cruiser is 0.6 m north of the intersection and the car is 0.8 m to the east, the police determines with radar that the distance between them and the car is increasing at 20 m/hr. If the cruiser is moving at 60 m/her at the instant of measurement, what is the speed of the car?

Q 11(3.11): Find the differential $d(tan3x)$ at $x = 0$.