

**Quiz Math 101 06.12.2010**

Name
Stud ID

1) Let  $f(x) = \begin{cases} x^2 & \text{if } x \leq 2 \\ mx + b & \text{if } x > 2 \end{cases}$

find the values of  $m$  and  $b$  that make  $f$  differentiable everywhere.

A)  $(m=4, b=-2)$  B)  $(m=4, b=-4)$  C)  $(m=2, b=0)$  D)  $(m=2, b=-2)$  E)  $(m=-2, b=2)$

2) Find the 50<sup>th</sup> derivative of  $y = \cos 2x$ .

A)  $2^{50} \cos(2x)$  B)  $-\cos(2^{50}x)$  C)  $2^{50} \sin(2x)$  D)  $-2^{50} \sin(2x)$  E)  $-2^{50} \cos(2x)$

3) Find the  $y$ -intercept of the normal line to the graph of  $y = \arcsin(\sqrt{x})$  at  $x = \frac{1}{4}$ .

A)  $\frac{\pi}{6} + \frac{\sqrt{3}}{8}$  B)  $\frac{1}{4} - \frac{\pi}{\sqrt{3}}$  C)  $\frac{\pi}{3} + \frac{\sqrt{3}}{8}$  D)  $\frac{\pi}{6} - \frac{\sqrt{3}}{4}$  E)  $\frac{1}{4} + \frac{\pi}{3\sqrt{3}}$

4) Evaluate the  $\lim_{x \rightarrow 1} \left( \frac{\sin(x-1)}{x^2 + x - 2} \right)$ .

A)  $\infty$  B)  $\frac{1}{2}$  C) 0 D)  $\frac{1}{3}$  E) does not exist

5) Find the derivative of the function  $f(x) = 2^{\sqrt{2x+3}} \cdot \sqrt{2x+3}$  at  $x = 3$ .

A)  $\frac{8(1-3\ln 2)}{3}$  B)  $\frac{8(1+3\ln 2)}{5}$  C)  $\frac{8(1+3\ln 2)}{3}$  D)  $\frac{32}{3}$  E)  $\frac{1-3\ln 2}{3}$