King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 101 (Term 172) – Quiz 5

Student Name_____ **Student ID:** _____

Exercise 1 [**4 points**]

Let $f(x) = \begin{cases} ax + 2b & ; \quad x \leq 0 \\ x^2 + 3a - b & ; \quad 0 < x \leq 2 \\ 3x - 5 & ; \quad x > 2 \end{cases}$

For which values of a and b, the function f is continuous at 0 and 2?

Exercise 2 [**3 points**]

A particle is moving along the hyperbola $xy = 16$. As it reaches the point $(8, 2)$, the y-coordinate is decreasing at a rate of $3\ cm/s$. How fast is the x-coordinate of the point changing at that instant?

Exercise 3 [**3 points**]

Let $y = mx + b$ be the equation of a line parallel to the line $y = (\ln 2)x$ and tangent to the graph of $y = 2^{x+3}$. Find m and b.