Name: _____

Math 151, Quiz #1, September 7, 2017

1. Find $\sin^2(\pi/3) + \cos^2(\pi/3)$.

Solution: For all x, $\sin^2(x) + \cos^2(x) = 1$.

2. Find the equation of the line parallel to $y = 3x - 5$ that passes through the point $(2, -6)$.

Solution: The slope is 3. Thus, using point slope form, the equation is $y-(-6) = 3(x-2)$. So $y + 6 = 3x - 6$ or $y = 3x - 12$ are both acceptable answers.

3. Let $f(x) = \frac{x^2-2x-15}{3x-15}$. Find the domain and range of f. Sketch a graph.

Solution: Note that the numerator factors: $x^2 - 2x - 15 = (x + 3)(x - 5)$ and the denominator is $3(x-5)$. So the function is undefined at $x = 5$ but elsewhere equals $(x+3)/3$. Thus the domain is $(-\infty, 5) \cup (5, \infty)$. The function looks like a line with a hole at $x = 5$. The y-value at this point is $(5 + 3)/3 = 8/3$. So the range is $(-\infty, 8/3) \cup (8/3, \infty)$. The graph is a line with slope of $1/3$, with y-intercept 1 with a hole at $(5, 8/3)$.