QUIZ 14 SOLUTIONS: LESSON 18
OCTOBER 12, 2018

Write legibly, clearly indicate the question you are answering, and put a box or circle around your final answer. If you do not clearly indicate the question numbers, I will take off points. Write as much work as you need to demonstrate to me that you understand the concepts involved. If you have any questions, raise your hand and I will come over to you.

1. [3 pts] Evaluate

$$f(x,y) = \frac{x^2+3y}{7\sqrt{4x+y}}$$

at $(3,-1)$. Round to 4 decimals.

Solution: We find $f(3,-1)$. We write

$$\begin{aligned} f(3,-1) &= \frac{(3)^2+3(-1)}{7\sqrt{4(3)+(-1)}} \\ &= \frac{9-3}{7\sqrt{12-1}} \\ &= \frac{6}{7\sqrt{11}} \\ &\approx \boxed{.2584} \end{aligned}$$

2. [7 pts] Find the domain and range of

$$f(x,y) = \sqrt{5x+16y}.$$

Solution: For an even root to make sense, the input must be non-negative, that is, we must have

$$5x+16y \geq 0.$$

Writing this in set builder notation, we have

$$\textbf{Domain} = \{(x,y) : 5x+16y \geq 0\}.$$

The range of $f(x,y)$ will be the same as the range of $z = \sqrt{t}$ (where $t = 5x+16y$). The range of $\sqrt{t}$ is $[0,\infty)$. We write this as

$$\textbf{Range} = \{z : z \geq 0\}.$$