

Practice for Quiz 1  
Math 2580  
Spring 2016

Sean Fitzpatrick

January 12th, 2016

If you can answer the following problems, you should be well-prepared for Quiz 1:

1. At what point does the line through the point  $(1, 0, 3)$  in the direction of the vector  $\mathbf{v} = \mathbf{i} + 2\mathbf{j} + \mathbf{k}$  cross the  $xy$ -plane?
2. Find the distance from the point  $(1, 2, 0)$  to the plane  $x - 2y + z = 4$ .
3. Find the area of the triangle whose vertices are  $(0, 1, 2)$ ,  $(1, 1, 1)$ , and  $(2, 1, 0)$ .
4. Determine the domain of the function  $f(x, y) = \frac{x + y}{x^2 + y^2 - 1}$  and find the value  $f(1, 2)$ .
5. For a given function  $f(x, y)$  of two variables and a value  $c$  in the range of  $f$ , what is the difference between the *level curve*  $f(x, y) = c$  and the *section*<sup>1</sup> of the graph  $z = f(x, y)$  corresponding to  $z = c$ ? How are the two related?
6. The subset of  $\mathbb{R}^2$  defined by the equation  $x^2 + y^2 = 1$  is the unit circle. What does this equation define as a subset of  $\mathbb{R}^3$ ?

---

<sup>1</sup>Sections are also known as *traces*