Practice for Quiz 1
Math 2580
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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 $f(x, y) = \dfrac{x + y}{x^2 + y^2 - 1}$ 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*[1] 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 $\mathbb{R}^3$?

[1] Sections are also known as *traces*