

Name SOLUTION

## Mathematics 1553

Quiz 1

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1. Give an example of a point in  $\mathbb{R}^4$ .

$$(\pi, e, \sqrt{2}, 0)$$

2. Which of the following equations are linear in  $x$ ,  $y$ , and  $z$ ? Select all that apply.

(a)  $x = 0$

(b)  $\pi x - 7y + \sqrt{2}z = e$

(c)  $xyz = 1$

(d)  $x^2 + y^2 + z^2 = 1$

3. Consider the following system of equations:

$$x - y - z = 1$$

$$x + y + z = 5$$

Which of the following are solutions to the system? Select all that apply.

(a)  $(0, 0, 0)$

(b)  $(3, 1, 1)$

(c)  $(5, 2, 2)$

Turn the page over!

4. Suppose I have two equations in three variables. Which of the following are possible solutions to the system?

- (a) the empty set
- (b) a single point
- (c) a line
- (d) a plane
- (e)  $\mathbb{R}^3$

Intersecting two planes  
in  $\mathbb{R}^3$ .

5. Consider the following system of equations:

$$\begin{aligned}x - y &= 0 \\x - y &= h\end{aligned}$$

For which values of  $h$  does this system of equations have a solution?

$$h = 0$$

For  $h \neq 0$  the lines are parallel  
and different.