

Score:

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SM 261 – Matrix Algebra – Quiz 16
Section 4.1 – Vector Spaces

1. Explain why the following do not represent vector spaces:

a. The first quadrant of the xy -plane.

If \vec{v} is in space, $-1 * \vec{v}$ is not in space

b. The plane $ax+bx+cz=1$.

Does not contain zero vector

c. The set of points inside a unit circle.

If \vec{u} & \vec{v} are in space, then it is possible for $\vec{u} + \vec{v}$ to not be in space

d. All polynomials of the form $at^3 + bt^2 + ct + 1$.

Does not contain 0 vector

2. Why is \mathbb{R}^2 not a subspace of \mathbb{R}^3 ?

It's like comparing apples to oranges.

$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \in \mathbb{R}^2$, $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \in \mathbb{R}^3$. Since vectors are of different lengths they cannot be equated or compared

3. Describe the possible subspaces of \mathbb{R}^3 .

line through origin
plane through origin
all of \mathbb{R}^3