1. Let $V = \{(x, y, z) \in \mathbf{R}^3 : x - y - z = 0\}$.

(A) V is not a subspace of $\mathbf{R}^3$.

(B) V is a 0 dimensional subspace of $\mathbf{R}^3$.

(C) V is a 1 dimensional subspace of $\mathbf{R}^3$.

(D) V is a 2 dimensional subspace of $\mathbf{R}^3$.

2. Let

$$V = \{(x, y, z) \in \mathbf{R}^3 : x - y - z = 0 \text{ and } y - 2z = 0\}.$$

(A) V is not a subspace of $\mathbf{R}^3$.

(B) V is a 0 dimensional subspace of $\mathbf{R}^3$.

(C) V is a 1 dimensional subspace of $\mathbf{R}^3$.

(D) V is a 2 dimensional subspace of $\mathbf{R}^3$.

3. Let $V = \{(x, y, z) \in \mathbf{R}^3 : x^2 + y^2 = 0\}$.

(A) V is not a subspace of $\mathbf{R}^3$.

(B) V is a 0 dimensional subspace of $\mathbf{R}^3$.

(C) V is a 1 dimensional subspace of $\mathbf{R}^3$.

(D) V is a 2 dimensional subspace of $\mathbf{R}^3$.

4. Let $V = \{p \in \mathcal{P}_2(\mathbf{R}) : p(-1) = p(1)\}$.

(A) V is not a subspace of $\mathcal{P}_2(\mathbf{R})$.

(B) V is a 0 dimensional subspace of $\mathcal{P}_2(\mathbf{R})$.

(C) V is a 1 dimensional subspace of $\mathcal{P}_2(\mathbf{R})$.

(D) V is a 2 dimensional subspace of $\mathcal{P}_2(\mathbf{R})$.

5. True or False?

If U and W are subspaces of $\mathbf{R}^8$ such that $\dim(U) = 3$, $\dim(W) = 5$ and $U + W = \mathbf{R}^8$, then in fact $U \oplus W = \mathbf{R}^8$.

6. If U and W are both 3 dimensional subspaces of $\mathbf{R}^5$, then the set of possible dimensions for $U \cap W$ is...

(A) 0, 1, 2, 3, 4, 5

(B) 0, 1, 2, 3

(C) 1, 2, 3

(D) None of the above.