Quiz 5

Name:

Let $\mathcal{P}_2$ be the vector space of polynomials of degree 2 (i.e., quadratic polynomials), and let S_1 and S_2 be the following subsets of $\mathcal{P}_2$:

$$S_1 = \left\{ 5x^2 - 4x + 1,\ 1 + 2x - x^2,\ 3x^2 - 3x \right\}, \quad S_2 = \left\{ 5 - 2x + 3x^2,\ 1 + x^2,\ 2x^2 - x + 2 \right\}.$$

For each of these sets, explain carefully why the set is or is not a basis for $\mathcal{P}_2$; one of these sets is a basis, and the other is not.