B13. **MATH 1300: Quiz #5**

Name _____ Student Number _____

1. (a) Consider the set *S* of all polynomials of type $ax^2 + (2a - 3)x + b$, where *a* and *b* range through the set of all real numbers. Is *S* a subspace of the vector space $\mathbb{P}_2$ of all polynomials of degree at most 2? Justify your answer.

(b) Consider the set *W* of all triples of type $(a, 0, b)$, where *a* and *b* range through the set of all real numbers. Is *W* a subspace of the Euclidean vector space $\mathbb{R}^3$? Justify your answer.

2. Let *U* be the subspace of the Euclidean vector space $\mathbb{R}^3$ consisting of all triples of type $(a, b, 0)$, where *a* and *b* range through the set of all real numbers, and let $S = \{(2,0,0),(0,5,0)\}$. Show that $span(S) = U$.

3. Is the subset $S = \{(1,0,0),(0,1,0),(1,2,3)\}$ of vectors in $\mathbb{R}^3$ linearly independent? Justify your answer.