MATH 234
QUIZ

Student Name: Key Student Number:

Question 1. Answer by true or false:

1. T Span$\{1+x, 1-x\}$ is a subspace of P_2
2. T If span$\{\mathbf{x}_1, \mathbf{x}_2, \mathbf{x}_3\} = R^3$ then span$\{\mathbf{x}_1, \mathbf{x}_2, \mathbf{x}_3, \mathbf{x}\} = R^3$ for any $\mathbf{x} \in R^3$.
3. F Suppose that $\{f_1, f_2, \ldots, f_n\} \subseteq C^{n-1}[a, b]$. If $W[f_1, \ldots, f_n] = 0$, where W denotes the Wronskien, then $f_1, f_2, \ldots, f_n$ are linearly dependent.
4. F If S is a subspace of V then any set of vectors in S that spans S also spans V.
5. T If S is a set of vectors that are linearly independent in a vector space V then any nonempty subset of S is linearly independent
6. F If S is a set of vectors that are linearly independent in a vector space V then any subset of V containing S is linearly independent

Question 2 Circle the most correct answer:

1. One of the following sets is linearly independent in P_3

   (a) $\{2, 2-x, x\}$
   (b) $\{2x, 2-x, x^2\}$
   (c) $\{1+x, 1-x, 1\}$
   (d) $\{x, x^2, 2x+3x^2\}$

2. Suppose that a vector space V contains n linearly independent vectors, then

   (a) Any n vectors in V are linearly independent
   (b) Any set containing more than n vectors is linearly dependent
   (c) If a set S spans V then S must contain at least n vectors
   (d) If a set S spans V then S must contain at most n vectors

3. Suppose that $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3\}$ are linearly independent in V, then

   (a) The vectors $\{\mathbf{v}_1, \mathbf{v}_1+\mathbf{v}_2, \mathbf{v}_2+\mathbf{v}_3\}$ are linearly independent in V
   (b) The vectors $\{\mathbf{v}_1+\mathbf{v}_2, \mathbf{v}_1+\mathbf{v}_3, \mathbf{v}_2+\mathbf{v}_3\}$ are linearly independent in V
   (c) The vectors $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_1+\mathbf{v}_2+\mathbf{v}_3\}$ are linearly independent in V
   (d) All of the above

4. One of the following is a subspace of $R^{n\times n}$

   (a) All triangular $n \times n$ matrices
   (b) All singular $n \times n$ matrices
   (c) All upper triangular $n \times n$ matrices
   (d) All nonsingular $n \times n$ matrices

5. One of the following is not a subspace of P_3

   (a) $\{p \in P_3 \,|p(2) = 0\}$
   (b) $\{p \in P_3 \,|p(1) = p(-1)\}$
   (c) $\{p \in P_3 \,|p(0) = 2\}$
   (d) $\{p \in P_3 \,|p(2) = p(5)\}$