

MATH 54 SUMMER 2017, QUIZ 11

Mark each of the following true or false. You do not have to provide an explanation.

- (a) The set of invertible 3×3 matrices is a subspace of the vector space of 3×3 matrices.
- (b) The set of constant functions from \mathbb{R} to \mathbb{R} is a subspace of the vector space of continuous functions from \mathbb{R} to \mathbb{R} (i.e. $C(\mathbb{R})$). (A function $f: \mathbb{R} \rightarrow \mathbb{R}$ is constant if for all real numbers x and y , $f(x) = f(y)$.)
- (c) The set of polynomials with integer coefficients of degree at most 3 is a subspace of the vector space of polynomials with real coefficients of degree at most 3 (i.e. \mathbb{P}_3).
- (d) The following vectors in $M_{2 \times 2}$ span all of $M_{2 \times 2}$ (recall that $M_{2 \times 2}$ is the vector space of all 2×2 matrices).

$$\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix} \quad \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix} \quad \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix} \quad \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$$

- (e) The following vectors in \mathbb{P}_4 are linearly independent: $x + 1$, $x^4 + x$, and $x^4 - 1$.