

QUIZ #11, 10/2/07

MATH 54, FALL 2007

Show your work and justify your answers! Feel free to use both sides.

Name:

1. Let $T(f) = 2f' + f''$ from P_2 to P_2 .

(a) (3 pts) Find the matrix of T with respect to the usual basis $(1, t, t^2)$.

(b) (3 pts) Find the kernel **and** the image of T .

2. (2 pts each) True or False? You needn't justify your answers.

(a) $\mathbb{R}^{2 \times 2}$ (the space of 2×2 matrices) is isomorphic to P_3 (the space of polynomials of degree at most 3). (That is, there exists an invertible linear transformation between them.)

(b) If $(\vec{v}_1, \vec{v}_2, \vec{v}_3)$ is a basis for a linear space V , then $(\vec{v}_2, \vec{v}_2 - \vec{v}_1, \vec{v}_3)$ is also a basis for V .