

Name:

1. Let  $B = \{1, 1 + x, 1 + x + x^2\}$  and  $C = \{x^2, x + x^2, 1 + x + x^2\}$  be two ordered bases for  $P_2$ .

(a) Let  $f(x) = 3 + 2x - x^2$ . Find  $[f]_B$  and  $[f]_C$ .

(b) Find the transition matrix from  $B$  to  $C$ .

2. Determine whether  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  defined by

$$T(x, y, z) = (1, x - y + 2z)$$

is a linear transformation. If it is, find the matrix representing it (relative to the standard bases). If not, explain why.