MATH 54 SUMMER 2017, QUIZ 13

Let $T\colon \mathbb{P}_2 \to \mathbb{P}_1$ be the function defined by
$$T(p) = p(1)x + p(2).$$

(a) Find $T(1)$, $T(x)$, and $T(x^2)$.

(b) Find the coordinate vectors relative to $\mathcal{C}$ of $T(1)$, $T(x)$, and $T(x^2)$.
$$\mathcal{B} = \{1, x, x^2\}$$
$$\mathcal{C} = \{1, x\}$$

(c) T is a linear transformation (you do not have to check this). Find the matrix of T relative to the bases $\mathcal{B}$ and $\mathcal{C}$.

(d) Is T one-to-one? Onto?