Q which of the following sets of vector are bases for P_2.

$$1-3x+2x^2,\ 1+x+4x^2,\ 1-7x$$

Solution:

$$P_1: 1-3x+2x^2,\ P_2: 1+x+4x^2,\ P_3: 1-7x$$

$$c_1P_1 + c_2P_2 + c_3P_3 = 0$$

$$c_1(1-3x+2x^2)+c_2(1+x+4x^2)+c_3(1-7x)=0$$

$$c_1+c_2+c_3 = 0$$

$$-3c_1+c_2-7c_3 = 0$$

$$2c_1+4c_2 = 0$$

$$A = \begin{bmatrix} 1 & 1 & 1 \\ -3 & 1 & -7 \\ 2 & 4 & 0 \end{bmatrix}$$

$$|A| = 1(0+28)-1(0+14)+1(-12-2)$$

$$= 28-14-14$$

$$= 28-28$$

$$\boxed{|A| = 0}$$ Non trivial

Linearly dependent

Not Basis.