

$$iv) F=1 \therefore X = 1 - \frac{k}{2} + \frac{k}{j}$$

$$X=2$$

$$X = 1 - \frac{k}{2} + \frac{k}{j} = 2$$

$$\therefore \frac{k}{j} - \frac{k}{2} = 1 \Rightarrow \frac{1}{j} - \frac{1}{2} = \frac{1}{k}$$

$$\therefore \frac{1}{2} = \frac{1}{j} + \frac{1}{k}$$

$$\text{If } j \geq 2 \quad \frac{1}{j} \leq \frac{1}{2} \therefore \frac{1}{2} - \frac{1}{j} = \frac{1}{k} \geq 0$$

$$\therefore -\frac{1}{k} = 0 \text{ or } -\frac{1}{k} > 0$$

$$\text{ie } -1 = 0 \times k = 0 \text{ or } k < 0$$

Neither are solns for k since k is a +ve integer, hence there are no solns for j, k, V, E .

$$vi) \text{ From iv) } X = 1 - \frac{k}{2} + \frac{k}{j}$$

$$X=1 \Rightarrow 1 = 1 - \frac{k}{2} + \frac{k}{j}$$

$$0 = k \left(\frac{1}{j} - \frac{1}{2} \right)$$

k is +ve so divide through by k
then $\frac{1}{j} = \frac{1}{2} \Rightarrow j=2$

then k is arbitrary. There are infinitely many solns.

$$2E = kF = k \Rightarrow k = 2E$$

$$2E = jV =$$

$$2 \times k/2 = 2V \Rightarrow k = 2V$$

$$vii) X=0 \Rightarrow 0 = 1 - \frac{k}{2} + \frac{k}{j}$$

$$0 = \frac{1}{k} - \frac{1}{2} + \frac{1}{j}$$