Q 2)

We know,

$$x_2^T F x_1 = 0$$

$$\underbrace{\quad}_{l_2}$$

$$\Rightarrow x_2^T l_2 = 0$$

Now all epipolar lines intersect at epipole

$$\Rightarrow e_2^T l_2 = 0 \quad \forall\, l_2$$

$$\Rightarrow e_2^T F x_1 = 0 \quad \forall\, x_1$$

$$\Rightarrow e_2^T F = 0$$

$$\Rightarrow F^T e_2 = 0$$

$\Rightarrow$ $e_2$ lies in null space of $F^T$

Illy

$$x_1^T F^T x_2 = 0$$

$$\underbrace{\quad}_{l_1}$$

$$x_1^T l_1 = 0 \quad \forall\, l_1$$

$$\Rightarrow x_1^T F^T x_2 = 0 \quad \forall\, x_2$$

$\Rightarrow Fe_1 = 0$

$\Leftrightarrow e_1$ lies in null space of $F$