1.

$$p(F|E) = \frac{p(E|F)p(F)}{p(E|F)p(F)+p(E|\bar{F})p(\bar{F})} =$$
$$\frac{\frac{1}{3}\cdot\frac{2}{3}}{\frac{1}{3}\cdot\frac{2}{3}+\frac{1}{4}\cdot\left(1-\frac{2}{3}\right)} = \frac{\frac{1}{3}\cdot\frac{2}{3}}{\frac{1}{3}\cdot\frac{2}{3}+\frac{1}{4}\cdot\frac{1}{3}} = \frac{8}{11}$$