→ $P(F=0) = ?$

$= P(F=0, B=r) + P(F=0, B=b)$

$= P(F=0 \mid B=r)\,P(B=r) + P(F=0 \mid B=b)\,P(B=b)$

$= \frac{6}{8} \cdot \frac{4}{10} + \frac{1}{4} \cdot \frac{6}{10} = \frac{3}{4} \cdot \frac{2}{5} + \frac{1}{4} \cdot \frac{3}{5}$

$= \frac{6+3}{20} = \frac{9}{20}$

→ $P(F=a)$

$= P(F=a, B=r) + P(F=a, B=b)$

$= P(F=a \mid B=r)\,P(B=r) + P(F=a \mid B=b)\,P(B=b)$

$= \frac{2}{8} \cdot \frac{4}{10} + \frac{3}{4} \cdot \frac{6}{10} = \frac{1}{4} \cdot \frac{2}{5} + \frac{3}{4} \cdot \frac{3}{5}$

$= \frac{2+9}{20} = \frac{11}{20}$

→ $P(B=r \mid F=0)$

$$\frac{P(F=0 \mid B=r)\,P(B=r)}{P(F=0)} = \frac{\frac{6}{8} \cdot \frac{4}{10}}{\frac{9}{20}} = \frac{\frac{3}{4} \cdot \frac{2}{5}}{\frac{9}{20}}$$

$= \frac{6}{9} = \frac{2}{3}$

→ $P(B=b \mid F=0)$

$$\frac{P(F=0 \mid B=b)\,P(B=b)}{P(F=0)} = \frac{\frac{1}{4} \cdot \frac{6}{10}}{\frac{9}{20}} = \frac{\frac{1}{4} \cdot \frac{3}{5}}{\frac{9}{20}}$$

$= \frac{3}{9} = \frac{1}{3}$

→ $P(B=r \mid F=a)$

$$\frac{P(F=a \mid B=r)\ P(B=r)}{P(F=a)} = \frac{\frac{2}{8} \cdot \frac{4}{10}}{\frac{11}{20}} = \frac{\frac{1}{4} \cdot \frac{2}{5}}{\frac{11}{20}}$$

$$= \frac{2}{11}$$

→ $P(B=b \mid F=a)$

$$\frac{P(F=a \mid B=b)\ P(B=b)}{P(F=a)} = \frac{\frac{3}{4} \cdot \frac{6}{10}}{\frac{11}{20}} = \frac{\frac{3}{4} \cdot \frac{3}{5}}{\frac{11}{20}}$$

$$= \frac{9}{11}$$