

20.

$$P(\text{Hitting target by Bill}) = 0.7$$

$$P(\text{Hitting target by George}) = 0.4$$

$$P(\text{not Bill}) = 0.3$$

$$P(\text{not George}) = 0.6$$

(a)

$$P(\text{George} | \text{Hit})$$

$$= \frac{P(\text{Hit} | \text{George})}{P(\text{Hit} | \text{George}) + P(\text{Hit} | \text{Bill})}$$

$$= \frac{0.4}{0.4 + 0.7}$$

$$= \frac{0.4}{1.1}$$

(a)

$$P(\text{George} | \text{hit})$$

$$= \frac{P(\text{George} | \text{not Bill})}{P(\text{George} | \text{not Bill}) + P(\text{Bill} | \text{not G})}$$

$$= \frac{P(\text{George} | \text{not Bill}) \cdot P(\text{not Bill})}{P(\text{George} | \text{not Bill}) \cdot P(\text{not Bill}) + P(\text{Bill} | \text{not G}) \cdot P(\text{not G})}$$

$$\begin{aligned}
 &= \frac{0.4 \times 0.3}{0.9 \times 0.3 + 0.7 \times 0.6} \\
 &= \frac{0.12}{0.12 + 0.42} \\
 &= \frac{0.12}{0.54} = \boxed{\frac{2}{9}} \text{ Ans.}
 \end{aligned}$$

$$\textcircled{b} P(\text{George} | \text{Hit})$$

$$= \frac{P(\text{George} \cap \text{Hit})}{P(\text{Hit})}$$

$$= \frac{0.4}{1 - (0.3 \times 0.6)}$$

$$= \frac{0.4}{1 - 0.18}$$

$$= \frac{0.40}{0.82} = \boxed{\frac{20}{41}} \text{ Ans.}$$