

conditional probability examples

$$(9) P(A|R) = \frac{n(A \text{ and } R)}{n(R)} \quad \text{Definition}$$

$$= \frac{\text{number of red aces}}{\text{number of red cards}}$$

$$= \frac{2}{26}$$

$$= \left(\frac{1}{13}\right) \approx \underline{0.077}$$

$$(10) P(R|A) = \frac{n(R \text{ and } A)}{n(A)}$$

$$= \frac{\text{number red aces}}{\text{number aces}}$$

$$= \frac{2}{4} = \left(\frac{1}{2}\right) = \underline{0.5}$$

$$(11) P(H|R) = \frac{n(H \text{ and } R)}{n(R)}$$

$$= \frac{\# \text{ Red Hearts}}{\# \text{ Red}} \quad \text{They are all Red!}$$

$$= \frac{13}{26} = \left(\frac{1}{2}\right) = \underline{0.5}$$

$$(12) \quad P(H|B) = \frac{n(H \text{ and } B)}{n(B)}$$

$$= \frac{\# \text{ of black hearts}}{\# \text{ black cards}}$$

They are no black hearts!

$$= \frac{0}{26} = \boxed{0}$$

$$(13) \quad P(SP|B) = \frac{n(SP \text{ and } B)}{n(B)}$$

$$\frac{\# \text{ Black Spades}}{\# \text{ Black}}$$

$$= \frac{13}{26}$$

They are all black!

$$= \left(\frac{1}{2}\right) = \boxed{0.5}$$

$$(14) \quad P(B|SP) = \frac{n(B \text{ and } SP)}{n(SP)}$$

$$= \frac{\# \text{ Black Spades}}{\# \text{ Spades}}$$

all Spades are black!

$$= \frac{13}{13} = \boxed{1}$$

$$(15) P(Q | F) = \frac{n(Q \text{ and } F)}{n(F)}$$

$$= \frac{\# \text{ Queens with faces!}}{\# \text{ face cards}}$$

$$= \frac{4}{12} = \left(\frac{1}{3}\right) \approx \underline{0.333}$$

$$(16) P(F | D) = \frac{n(F \text{ and } D)}{n(D)}$$

$$= \frac{\# \text{ face cards with diamonds}}{\# \text{ diamonds}}$$

$$= \left(\frac{3}{13}\right) \approx \underline{0.231}$$