## **Conditional Probability** Total points = 24

1. P(studies and passes) = 
$$\frac{17}{20}$$
,  $\checkmark$  P(studies) =  $\frac{15}{16}$   $\checkmark$  P(passes|studied) =  $\frac{P(\text{studies and passes})}{P(\text{studies})}$   $\checkmark$  =  $\frac{\frac{17}{20}}{\frac{15}{16}}$   $\checkmark$  =  $\frac{68}{75}$   $\checkmark$ 

2. 
$$P(smokes) = \frac{3}{10} \checkmark$$

P(smokes and develops lung cancer) = 
$$\frac{4}{15}$$
 V
P(develops lung cancer|smokes) =

$$\frac{P(\text{smokes and develops lung cancer})}{P(\text{smokes})} \checkmark = \frac{\frac{4}{15}}{\frac{3}{10}} \checkmark = \boxed{\frac{8}{9}} \checkmark$$

$$P(France in summer|Mexico in winter) = \\ P(Mexico in winter and France in summer)$$

$$= \frac{0.40}{0.60} \checkmark = \boxed{0.67} \checkmark$$

4. P(peso coin shows heads) = 
$$\frac{1}{2}$$

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$$\frac{1}{2}$$
   
P(five-peso coin shows heads|peso coin shows heads) = P(five-peso coin shows heads)

$$=$$
 $\left[\frac{1}{2}\right]$ 

5. a. P(not white | blue) = 
$$\frac{P(\text{not white and blue})}{P(\text{blue})}$$

$$=\frac{\frac{2}{11}}{\frac{3}{12}} \checkmark = \boxed{\frac{8}{11}} \checkmark$$

b. P(not red | white) = 
$$\frac{P(\text{not red and white})}{P(\text{white})}$$

$$=\frac{\frac{7}{33}}{\frac{4}{12}}\checkmark=\boxed{\frac{7}{11}}\checkmark$$

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P(five-peso coin shows heads|peso coin shows heads) = P(five-peso coin shows heads) 
$$\checkmark$$

$$=\boxed{\frac{1}{2}}$$

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$$\frac{P(\text{Mexico in winter and France in summer})}{P(\text{Mexico in winter})}$$

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P(five-peso coin shows heads|peso coin shows heads) = P(five-peso coin shows heads)  $\checkmark$ 

5. a. P(not white | blue) = 
$$\frac{P(\text{not white and blue})}{P(\text{blue})}$$
  $\checkmark$ 

$$= \frac{\frac{2}{11}}{3} \checkmark = \boxed{\frac{8}{11}} \checkmark$$

b. P(not red | white) = 
$$\frac{P(\text{not red and white})}{P(\text{white})}$$
  $\checkmark$ 

$$= \frac{\frac{7}{33}}{\frac{4}{12}} \checkmark = \frac{7}{11} \checkmark$$

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3. P(Mexico in winter and France in summer) = 
$$0.40 \checkmark$$
 P(Mexico in winter) =  $0.60 \checkmark$ 

$$P(France in summer|Mexico in winter) = \\ P(Mexico in winter and France in summer)$$

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