Conditional Probability

Total points = 24

1. $P(\text{studies and passes}) = \frac{17}{20}$, ✓ $P(\text{studies}) = \frac{15}{16}$ ✓

   $P(\text{passes}|\text{studied}) = \frac{P(\text{studies and passes})}{P(\text{studies})}$ ✓

   $= \frac{\frac{17}{20}}{\frac{15}{16}}$ ✓ $= \boxed{\frac{68}{75}}$ ✓

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

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

   $P(\text{develops lung cancer}|\text{smokes}) =$

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

3. $P(\text{Mexico in winter and France in summer}) = 0.40$ ✓

   $P(\text{Mexico in winter}) = 0.60$ ✓

   $P(\text{France in summer}|\text{Mexico in winter}) =$

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

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

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

   $P(\text{five-peso coin shows heads}|\text{peso coin shows heads}) =$

   $P(\text{five-peso coin shows heads})$ ✓

   $= \boxed{\frac{1}{2}}$ ✓

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

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

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

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

Conditional Probability

Total points = 24

1. $P(\text{studies and passes}) = \frac{17}{20}$, ✓ $P(\text{studies}) = \frac{15}{16}$ ✓

   $P(\text{passes}|\text{studied}) = \frac{P(\text{studies and passes})}{P(\text{studies})}$ ✓

   $= \frac{\frac{17}{20}}{\frac{15}{16}}$ ✓ $= \boxed{\frac{68}{75}}$ ✓

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

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

   $P(\text{develops lung cancer}|\text{smokes}) =$

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

3. $P(\text{Mexico in winter and France in summer}) = 0.40$ ✓

   $P(\text{Mexico in winter}) = 0.60$ ✓

   $P(\text{France in summer}|\text{Mexico in winter}) =$

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

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

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

   $P(\text{five-peso coin shows heads}|\text{peso coin shows heads}) =$

   $P(\text{five-peso coin shows heads})$ ✓

   $= \boxed{\frac{1}{2}}$ ✓

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

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

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

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

Conditional Probability

Total points = 24

1. $P(\text{studies and passes}) = \frac{17}{20}$, ✓ $P(\text{studies}) = \frac{15}{16}$ ✓

   $P(\text{passes}|\text{studied}) = \frac{P(\text{studies and passes})}{P(\text{studies})}$ ✓

   $= \frac{\frac{17}{20}}{\frac{15}{16}}$ ✓ $= \boxed{\frac{68}{75}}$ ✓

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

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

   $P(\text{develops lung cancer}|\text{smokes}) =$

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

3. $P(\text{Mexico in winter and France in summer}) = 0.40$ ✓

   $P(\text{Mexico in winter}) = 0.60$ ✓

   $P(\text{France in summer}|\text{Mexico in winter}) =$

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

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

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

   $P(\text{five-peso coin shows heads}|\text{peso coin shows heads}) =$

   $P(\text{five-peso coin shows heads})$ ✓

   $= \boxed{\frac{1}{2}}$ ✓

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

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

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

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

Conditional Probability

Total points = 24

1. $P(\text{studies and passes}) = \frac{17}{20}$, ✓ $P(\text{studies}) = \frac{15}{16}$ ✓

   $P(\text{passes}|\text{studied}) = \frac{P(\text{studies and passes})}{P(\text{studies})}$ ✓

   $= \frac{\frac{17}{20}}{\frac{15}{16}}$ ✓ $= \boxed{\frac{68}{75}}$ ✓

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

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

   $P(\text{develops lung cancer}|\text{smokes}) =$

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

3. $P(\text{Mexico in winter and France in summer}) = 0.40$ ✓

   $P(\text{Mexico in winter}) = 0.60$ ✓

   $P(\text{France in summer}|\text{Mexico in winter}) =$

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

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

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

   $P(\text{five-peso coin shows heads}|\text{peso coin shows heads}) =$

   $P(\text{five-peso coin shows heads})$ ✓

   $= \boxed{\frac{1}{2}}$ ✓

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

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

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

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