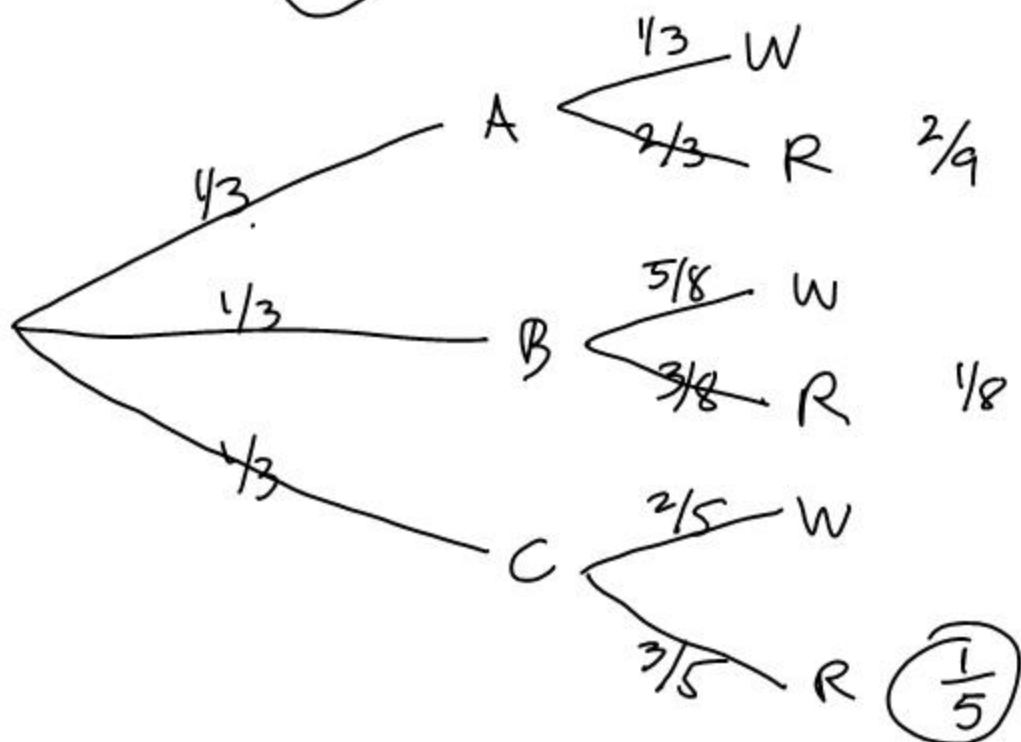


#8



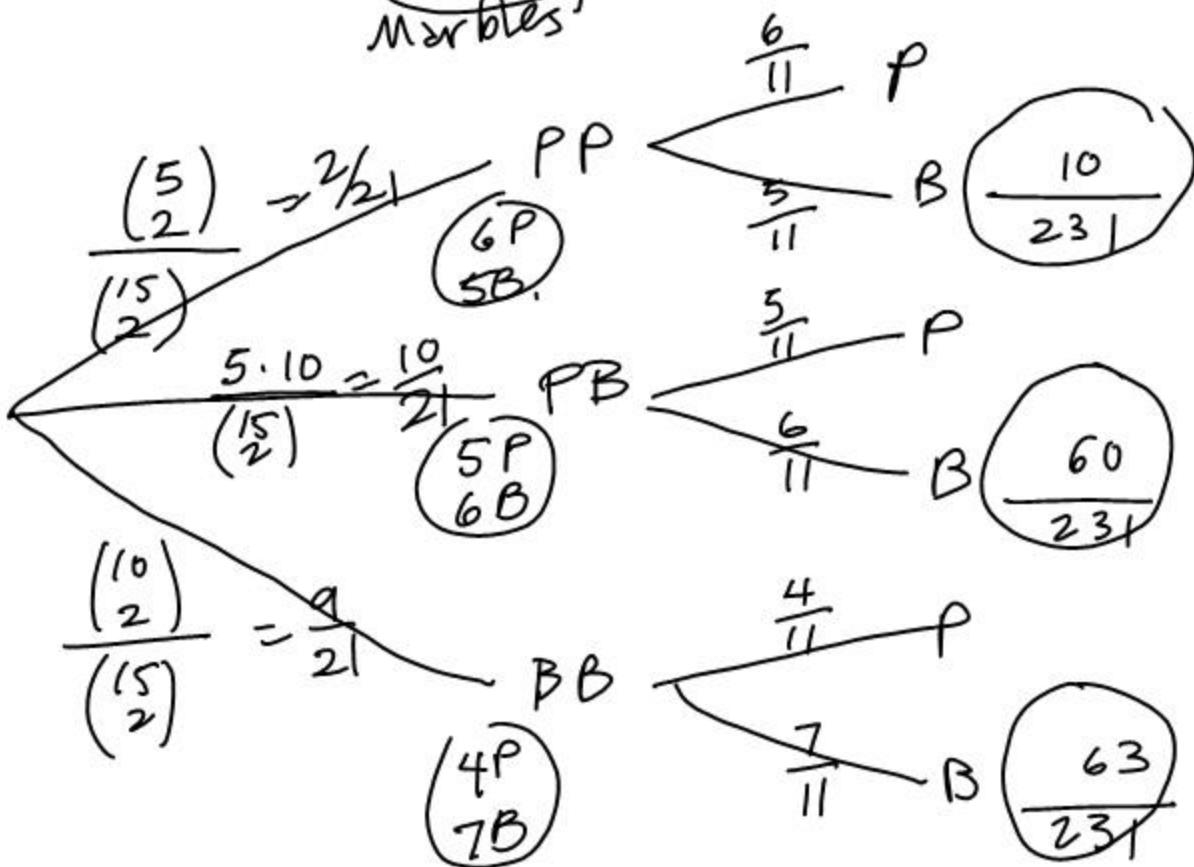
$$a) P(\text{Red}) = \frac{2}{9} + \frac{1}{8} + \frac{1}{5} = \frac{197}{360}$$

$$b) P(C|R) = \frac{P(C \cap R)}{P(R)} = \frac{\frac{1}{5}}{\frac{197}{360}} = \frac{72}{197}$$

(#10)



2
Marbles



$$P(\text{Brown}) = \frac{133}{231} = \frac{19}{33}$$

$$\frac{\binom{5}{2}}{\binom{15}{2}} = \frac{10}{105} = \frac{2}{21}$$

$$\frac{50}{105} = \frac{10}{21}$$

$$\frac{15 \cdot 7 \cdot 4 \cdot 3!}{2! \cdot 13!}$$

$$\frac{10 \cdot 9 \cdot 8!}{2! \cdot 8!} = 45$$

$$\frac{45}{105} = \frac{9}{21}$$

$$P(P|P) = \frac{P(P \cap P)}{P(P)} = \frac{\frac{2}{21} \cdot \frac{6}{11}}{1 - \frac{19}{33}}$$

$$= \frac{12}{\frac{231}{98}} = \frac{12}{98} = \frac{6}{49}$$

\uparrow
 $P(B)$

$$(c) P(BB|P) = \frac{P(BB \cap P)}{P(P)} = \frac{\frac{9}{21} \cdot \frac{4}{11}}{\frac{98}{231}}$$

$$= \frac{36}{98} = \frac{18}{49}$$

#13

Bayes

$$\underline{\underline{P(320^T, 320^S | 160)}}$$

$$= \frac{P(320, 320) P(160 | 320, 320)}{P(320, 320) \cdot P(160 | 320, 320) + P(320, 320') \cdot P(160 | 320, 320')}$$

$P(160 | 320, 320')$

Easy

$$P(160^S | 320^T, 320)$$

$$= \frac{\left(\frac{8}{20} \cdot \frac{7}{19}\right) \left(\frac{12}{18}\right)}{\frac{8}{20} \cdot \frac{7}{19} \cdot \frac{12}{18} + \frac{8}{20} \cdot \frac{12}{19} \cdot \frac{11}{18} + \frac{12}{20} \cdot \frac{11}{19} \cdot \frac{10}{18} + \frac{12}{20} \cdot \frac{8}{19} \cdot \frac{11}{18}}$$

360, 160

160, 160

160, 360

$$\frac{2}{5} \cdot \frac{7}{19} \cdot \frac{2}{3} = \frac{28}{285}$$

$$= \frac{28/285}{38/63} = 0.163$$

$$P(1 \text{ roll}) = \frac{1}{6}$$

$$P(2 \text{ rolls}) = 1 - \left(\frac{5}{6}\right)\left(\frac{5}{6}\right)$$

$$P(3 \text{ rolls}) = 1 - \left(\frac{5}{6}\right)\left(\frac{5}{6}\right)\left(\frac{5}{6}\right)$$

$$\text{For } n \text{ rolls, } 1 - \left(\frac{5}{6}\right)^n$$

$$\text{For 17 rolls, } 1 - \left(\frac{5}{6}\right)^{17} \approx 0.955$$

$$\boxed{\#2} \quad P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$P(B|A) = \frac{P(A) + P(B) - P(A \cup B)}{P(A)}$$

$$\frac{1}{3} = \frac{P(A) + \frac{1}{3} - \frac{11}{12}}{P(A)}$$

$$P(A) = 3P(A) + 1 - \frac{11}{4}$$

$$\frac{7}{4} = 2P(A) \longrightarrow P(A) = \frac{7}{8}$$

| <u>Weight</u> | <u>freq.</u> |
|-------------------|--------------|
| $40 \leq x < 50$ | 3 |
| $50 \leq x < 60$ | 6 |
| $60 \leq x < 70$ | 11 |
| $70 \leq x < 80$ | 10 |
| $80 \leq x < 90$ | 3 |
| $90 \leq x < 100$ | 3 |

Modal class

$$60 \leq x < 70$$