MATH 1500
Section 6.4 HW Solutions: 3, 7, 9, 11, 13, 14

3. a. $\Pr(E|F) = \dfrac{0.1}{0.4} = \dfrac{1}{4}$

b. $\Pr(F|E) = \dfrac{0.1}{0.5} = \dfrac{1}{5}$

c. $\Pr(E|F') = \dfrac{0.4}{0.6} = \dfrac{2}{3}$

d. $\Pr(E'|F') = \dfrac{0.2}{0.6} = \dfrac{1}{3}$

7. a. $\Pr(F \mid E) = \dfrac{\Pr(E \cap F)}{\Pr(E)}$

$0.25 = \dfrac{\Pr(E \cap F)}{0.4}$

$\Pr(E \cap F) = 0.1$

b. $\Pr(E \cup F) = 0.4 + 0.3 - 0.1 = 0.6$

c. $\Pr(E|F) = \dfrac{0.1}{0.3} = \dfrac{1}{3}$

d. $\Pr(E' \cap F) = 0.3 - 0.1 = 0.2$

9. $\Pr(8 \mid \text{not } 7) = \dfrac{\Pr(8 \cap \text{not } 7)}{\Pr(\text{not } 7)}$

$\Pr(8 \mid \text{not } 7) = \dfrac{\frac{5}{36}}{\frac{30}{36}}$

$\Pr(8 \mid \text{not } 7) = \dfrac{5}{30} = \dfrac{1}{6}$

11. 0; because exactly one coin shows heads therefore there are two tails.

13. $\dfrac{\text{[number of outcomes that four are white]}}{\text{[number of outcomes that at least 1 is white]}}$

$$\frac{C(7,4)}{C(12,4) - C(5,4)} = \frac{35}{495 - 5} = \frac{35}{490} = \frac{1}{14} \approx 0.0714$$

14. $\dfrac{\text{[number of outcomes that two are white]}}{\text{[number of outcomes that at least 1 is white]}}$

$= \dfrac{C(2,\ 2)}{C(5,\ 2) - C(3,2)}$

$= \dfrac{1}{10 - 3}$

$= \dfrac{1}{7} \approx 0.1429$