MATH 312 Finite Math
Review for Exam II

1. $P = 100$ ($x = 10$, $y = 50$, $z = 0$, $u = 0$, $v = 0$, $w = 40$).

2. $C = 20$ ($x = \frac{5}{16}$, $y = \frac{9}{16}$, $u = 0$, $v = 0$).

3. $P = 28$ ($x = 0$, $y = 14$, $z = 0$, $u = 21$, $v = 0$).

4. (b) No.

5. (a) 18, (b) 177.

6. (a) $(0.01)^4(0.02)^3 = 8 \times 10^{-14}$. (b) $1 - (0.99)^4(0.98)^3 = 0.09589$.

7. (b) $P(A \cap F) = (0.7)(0.02) = 0.014$.
(c) $P(F) = (0.7)(0.02) + (0.3)(0.05) = 0.029$. (d) $P(B|F) = P(B \cap F)/P(F) = 0.015/0.029 = 0.51724$.

8. (a) $P(\text{Paris}|\text{Rome}) = 0.2/0.3 = 2/3$. (b) $P(\text{Rome}|\text{Paris}) = 0.2/0.5 = 0.4$.
(c) $P(\text{neither}) = 0.4$ (complement of $P(\text{Rome} \cup \text{Paris}) = 0.5 + 0.3 - 0.2 = 0.6$).

9. (a) People taking math 312 who are male or don't skip class Friday.
(b) $(A \cap B') \cup (A' \cap B)$.

10. (a) $\frac{7!}{3!2!2!} = 210$. (b) $\binom{7}{2}2^5(-3)^2 = 6048$, 0. (c) $(1+9)^n = 10^n$.

11. (a) $\frac{\binom{15}{5}}{\binom{25}{5}} = \frac{13}{230}$. (b) $\frac{\binom{10}{2}\binom{15}{3}}{\binom{25}{5}} = \frac{195}{506}$.
(c) $1 - P(\text{no men}) = \frac{217}{230}$.
(d) No! $A =$ At least one man, $B =$ At least one woman, $P(A \cap B) = \frac{475}{506} \neq \frac{217}{230}\frac{1259}{1265} = P(A)P(B)$.

12. (a) $\frac{\binom{7}{3}}{6^7} = \frac{35}{6^7}$. (b) $\frac{\binom{7}{3}5^4}{6^7} = \frac{21875}{6^7}$.
(c) $1 - P(\text{two or less}) = 1 - \frac{5^7}{6^7} - \frac{\binom{7}{1}5^6}{6^7} - \frac{\binom{7}{2}5^5}{6^7} = \frac{26811}{6^7}$.

13. (a) $10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 = 30240$. (b) $\binom{10}{3}\binom{7}{2} = 2520$. (c) $4 \cdot 9 \cdot 8 \cdot 7 \cdot 6 = 12096$, $\binom{4}{3}\binom{7}{2} = 84$.

14. $1 - P(\text{all different}) = 1 - \frac{6 \cdot 5 \cdot 4 \cdot 3}{6^4} = \frac{13}{18}$.