

## Math 8: Homework #6 Solution

### 2.6 - 2

- a) Since  $\#A = 24$ ,  $\#B = 21$ , and  $\#(A \cup B) = 37$ , then  $\#(A \cap B) = 24 + 21 - 37 = 8$
- b) Since  $\#(A \cap B) = 8$ , then  $\#(A - B) = 24 - 8 = 16$
- c) Similarly,  $\#(B - A) = 21 - 8 = 13$
- d) Since  $\#(B - C) = 10$  and  $\#B = 21$ , then  $\#(B \cap C) = 11$ . So  $\#(B \cup C) = 10 + 12 + 11 = 33$
- e)  $\#C = 12 + 11 = 23$
- f)  $\#(A \cup C) = 24 + 23 - 11 = 36$

### 2.6 - 4

- a) Combination rule:  $\frac{13!}{4!9!}$
- b) Combination rule and product rule:  $\frac{4!}{1!3!} * (3 * \frac{3!}{1!2!})$
- c) Combination rule and product rule:  $\frac{5!}{2!3!} * \frac{8!}{2!6!}$
- d) Permutation rule:  $\frac{4!}{0!} = 4!$

### 2.6 - 14

- a)  $\frac{19!}{3!16!} = 969$
- b)  $\frac{11!}{2!9!} * \frac{8!}{1!7!} = 440$
- c)  $\frac{11!}{1!10!} * \frac{8!}{2!6!} = 308$

### 2.6 - 15

$$\frac{5!}{2!3!} * \frac{9!}{2!7!} = 360$$

### 2.6-17

- a)  $(a + b)^6 = a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$
- b)  $(a + 2b)^4 = a^4 + 4a^3(2b) + 6a^2(2b)^2 + 4a(2b)^3 + (2b)^4 = a^4 + 8a^3b + 24a^2b^2 + 32ab^3 + 16b^4$

c)  $\frac{13!}{3!10!} = 286$

d) The coefficient of  $a^2(2b)^{10}$  is  $\frac{12!}{2!10!} = 66$ . And  $2^{10} = 1024$ . So the coefficient of  $a^2b^{10}$  is  $66 * 1024 = 67584$