

Week in Review #4

1. (a) $C(4, 2) * C(7, 4) = 210$

(b) exactly two red and 4 other balls.

$$C(4, 2) * C(15, 4) = 8190$$

(c) at least means two or more green balls.

$$C(7, 2) * C(12, 4) + C(7, 3) * C(12, 3) + C(7, 4) * C(12, 2) + C(7, 5) * C(12, 1) + C(7, 6) * C(12, 0) = 20664$$

or work this by Total - don't want

$$C(19, 6) - [C(7, 0) * C(12, 6) + C(7, 1) * C(12, 5)] = 20664$$

(d) the key word is or. Use the formula: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$C(4, 2) * C(15, 4) + C(8, 4) * C(11, 2) - C(4, 2) * C(8, 4) = 11620$$

(e) the key word is or. Use the formula: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$C(4, 2) * C(15, 4) + C(7, 3) * C(12, 3) - C(4, 2) * C(7, 3) * C(8, 1) = 14210$$

2. For this problem somebody may have both vegetable dishes be the same or both vegetable dishes be different. This means we have to break the problem into two parts.

part I: both vegetable dishes different.

$$C(10, 1) * C(13, 2) * C(8, 1) \text{ or } 10 * C(13, 2) * 8$$

Part II: both vegetable dishes the same.

$$C(10 * 1) * C(13, 1) * C(8, 1) \text{ or } 10 * 13 * 8$$

$$\text{Answer: } C(10, 1) * C(13, 2) * C(8, 1) + C(10 * 1) * C(13, 1) * C(8, 1) = 6240 + 1020 = 7260$$

3. $C(20, 5) * C(15, 5) * C(10, 5) * C(5, 5)$

4. $\frac{14!}{2!3!2!2!} = 1816214400$

5. $P(9, 2) * C(7, 3)$

or

$$C(9, 1) * C(8, 1) * C(7, 3)$$

6. (a) $\frac{8 * 7 * 13}{15 * 14 * 13}$

(b) $\frac{8 * 7 * 3}{15 * 14 * 13}$

7. $\frac{C(8, 3)C(22, 7)}{C(30, 10)}$

8. $\frac{6 * 1 * 4 * 1 * 2 * 1}{6 * 5 * 4 * 3 * 2 * 1} = \frac{1}{15} = 0.0667$

9. (a) $\frac{C(10, 6)}{C(26, 6)} = 0.00091231$

(b) remember that a majority mean more than half.

$$\frac{C(9, 4) * C(17, 2) + C(9, 5) * C(17, 1) + C(9, 6) * C(17, 0)}{C(26, 6)} = 0.0840985$$

$$(c) \frac{C(4, 4) * C(22, 2)}{C(26, 6)} = \frac{3}{2990} = 0.0010033445$$

$$(d) \frac{C(4, 2) * C(22, 4)}{C(26, 6)} = \frac{57}{299} = 0.1906354515$$

$$10. \frac{C(7, 2) * C(8, 8) + C(7, 3) * C(8, 7) + C(7, 4) * C(8, 6)}{C(15, 10)} = \frac{69}{143} = 0.426573$$

$$11. \frac{1}{\frac{11!}{4!4!2!}} = 0.00002886$$

$$12. \frac{C(4, 2)}{C(52, 2)} = \frac{1}{221} = 0.0045$$

$$13. \frac{3(1 * 1 * 14)}{15^3} + \frac{1}{15^3}$$