

# ICP Key

Wednesday, December 9, 2015 8:21 AM

Precal  
Review 9.1-10.1

Name: *key*  
Period:

1. A card is drawn from a normal 52 card deck which consists of:
- 13 cards in each suit (diamond, clubs, spades, and hearts)
  - 3 of the thirteen in each suit are face cards. There is one ace for each suit.

- a) Calculate P(the card is a five)

$$4/52 = \boxed{1/13}$$

or 
$$\frac{4C_1}{52C_1}$$

- b) Calculate P(the card is a five or six)

$$1/13 + 1/13 = \boxed{2/13}$$

or 
$$\frac{4C_1 + 4C_1}{52C_1}$$

- c) Calculate P(the card is between, non-inclusive of five and ten)

$$\boxed{4/13}$$

6 7 8 9  
$$\frac{4C_1 + 4C_1 + 4C_1 + 4C_1}{52C_1}$$

2. In your reading class has a reading list that consists of 11 fiction books and 7 non-fiction books.

- a) In how many ways can you select a fiction and a non-fiction book?

OR  $11 \cdot 7 = 77$

$$11C_1 \cdot 7C_1 = \boxed{77}$$

- b) In how many ways could you select a fiction book and then another fiction book?

$$11P_2 = 11 \cdot 10 = \boxed{110}$$

3. Fourteen people try-out for a softball team. In how many ways could they select:

- a) a First basemen and a Third basemen *Roles are defined!*

$$14P_2 = 14 \cdot 13 = \boxed{182}$$

- b) After picking your First and then Third Basemen, how many ways can you select a catcher and then another catcher?

*12 left*

$$12P_2 = 12 \cdot 11 = \boxed{132}$$

4. A bag contains 6 green, 4 blue and 7 yellow balls. Find the probability of drawing 3 balls of the same color.

$$\frac{{}^6C_3 + {}^4C_3 + {}^7C_3}{{}^{17}C_3} = \frac{59}{680} = \boxed{.089}$$

5. How many license plates can be made with 2 letters followed by three numbers if letters and numbers CANNOT be repeated?

$$26 \cdot 25 \cdot 10 \cdot 9 \cdot 8 \quad \text{OR} \quad {}_{26}P_2 \cdot {}_{10}P_3$$

$$\boxed{468,000}$$

6. If license plates consist of 7 letters (repeats are possible), what is the probability your plate is LUVMATH?

$$26 \cdot 26 \cdot 26 \cdot 26 \cdot 26 \cdot 26 \cdot 26 \quad \leftarrow \begin{array}{|c|} \hline 1 \\ \hline 26^7 \\ \hline \end{array} \quad \text{only 1 way}$$

7. A group of 12 are getting in line to ride the Raging Bull. Kelly and Will insist that they stand next to each other, (they are in the group of 12). What is the probability that they will be standing next to each other in the group of 12?

10 friends + couple  
↓  
treat them as 1

$$\frac{11! \cdot 2!}{12!} = \boxed{.167}$$

8. Find the number of distinguishable permutations of the letters in each word.

a. ALPHABET

2 A's!

$$\frac{8!}{2!} = \boxed{20160}$$

B. GOOGLE 2 G's, 2 O's

$$\frac{6!}{2!2!} = \boxed{180}$$

9. A committee of 8 teachers is selected from a faculty of 20 (13 women and 7 men).

a. How many ways could this committee be composed?  ${}_{20}C_8$

b. What is the probability that at least 1 women will be selected?

only 7 men  $\Rightarrow$  need at least 1 man to complete group

$$\boxed{100\%}$$

Just for fun...

10. Solve for n. There will be no credit for just an answer. You must show all work.

$${}_nP_5 = 3({}_{n+1}P_4)$$