Quiz 6 Review Sheet

Name: Key

Vocabulary - *Use your notes to find the exact answer that fits each blank.*

1. Two events A and B are ___independent___ if the fact that A occurs does not change the probability of B occurring.
2. Two events are considered ___dependent___ when the outcome of the first event changes the probability of the second event occurring.
3. The probability that event B occurs knowing that event A already occurred is called ___conditional___ probability.
4. To solve a ___factorial___ multiply n times every number between 1 and n.
5. A ___permutation___ is an arrangement of n objects in which the order of the objects is a distinguishing factor.
6. A ___combination___ is a selection of objects without regard to order because order does not distinguish one set of objects from another.
7. The symbol for Conditional Probability is $P(B|A)$, and is read as "probability of B given A."
8. The first step of solving a two-way table probability problem is to transform the table into a ___probability table___.

Work Problems—*answer each question fully.*

~~ISN pgs: 35-36~~

9. In how many ways can a committee of three persons be chosen from four married couples if all persons are equally eligible? (↙ 8 people) $_8C_3 = \frac{8!}{(8-3)!3!} =$ **56**
10. How many 5-digit numbers can be created from the digits 3, 1, 6, 4, 0, 8, and 2 without repeating any? $_7P_5 = \frac{7!}{(7-5)!} =$ **2520**
11. Eight people are running for the school board. The person with the highest number of votes is the chair of the board, the second highest will be vice-chair, and the third highest vote-getter will serve as the secretary. In how many ways can the positions be filled? $_8P_3 = \frac{8!}{(8-3)!} =$ **336**
12. PA license plates have 3 letters followed by 4 numbers.
    - If the same letter or number can be repeated, how many can be made?
      $26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 =$ **175,760,000**
    - If the same letter CANNOT be repeated, how many can be made?
      $26 \cdot 25 \cdot 24 \cdot 10 \cdot 9 \cdot 8 \cdot 7 =$ **78,624,000**

ISN pgs. 35-36

Students were planning on going on a school picnic. The teacher was taking a survey of who was going and who was not. Suppose that any one of these students is randomly selected.

Students	Going to picnic	Not going to picnic	
Boys	14	25	39
Girls	16	5	21
	30	30	

13. P(girl) = $\frac{21}{60}$

14. P(boy) = $\frac{39}{60}$

15. P(not going) = $\frac{30}{60}$

16. P(going) = $\frac{30}{60}$

17. P(girl | going) = $\frac{16}{21}$

18. P(boy | not going) = $\frac{25}{39}$

19. P(going | boy) = $\frac{14}{30}$

20. P(not going | girl) = $\frac{5}{30}$

~~ISN pgs. 37-38~~

21. 10 people were trying to be one of the first 5 callers to a radio station. How many different set of people could have succeeded?

$${}_{10}C_5 = \frac{10!}{(10-5)!\,5!} = \boxed{252}$$

22. For summer reading, a teacher gives her students 20 novels to choose from. Each student must read 3 of these novels. In how many ways can a student select 3 novels to read?

$${}_{20}C_3 = \frac{20!}{(20-3)!\,3!} = \boxed{1140}$$

23. How many ways can 8 paintings be line up on a wall?

$$8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = \boxed{40{,}320}$$

24. The volleyball team has 9 players, but only 6 can be on the court at one time. How many different ways can the team fill the court?

$${}_9P_6 = \frac{9!}{(9-6)!} = \boxed{60{,}480}$$

ISN pgs. 33-34

Find the probability of drawing the given cards from a standard 52-card deck.

25. A 2, then a face card without replacing either — dependent

$$\frac{4}{52} \cdot \frac{12}{51} = \boxed{\frac{48}{2652}}$$

26. A 2, then a face card replacing both — independent

$$\frac{4}{52} \cdot \frac{12}{52} = \boxed{\frac{48}{2704}}$$

27. A jack, then a king without replacing either — dependent

$$\frac{4}{52} \cdot \frac{4}{51} = \boxed{\frac{16}{2652}}$$

28. A jack, then a king replacing both — independent

$$\frac{4}{52} \cdot \frac{4}{52} = \boxed{\frac{16}{2704}}$$

29. A heart, then a diamond, then another heart without replacing any. — dependent

$$\frac{13}{52} \cdot \frac{13}{51} \cdot \frac{12}{50} = \boxed{\frac{2028}{132600}}$$

30. All three are jacks without replacing any — dependent

$$\frac{4}{52} \cdot \frac{3}{51} \cdot \frac{2}{50} = \boxed{\frac{24}{132600}}$$

31. All three are red cards replacing each after its drawn — independent

$$\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} = \boxed{\frac{2197}{140608}}$$