Unit 7 Quiz Review

Name ___Key___

SHOW YOUR WORK!

1. How many three letter words can be formed if repetition of the letters is
   (a) allowed?

   L_1 | L_2 | L_3
   26 | 26 | 26 $\quad = 17576$

   (b) not allowed?

   26 $\quad$ 25 $\quad$ 24 $\quad = 15600$

2. Dancing with the Stars has 10 female and 6 males who have made it passed round one of the auditions. If the judges want to see them pair up female/male for the next round of elimination, how many dancing pairs can they make?

   $_{16}C_2 = 120$

3. In how many different ways can president, vice president and secretary be chosen from a class of 15 students?

   $_{15}P_3 = 2730$

4. In how many different ways can five red balls, two white balls and seven black balls be arranged in a row?

   $\dfrac{14!}{(5!\,2!\,7!)} = 72072$

5. In how many ways can six different mathematics books be placed next to each other on a shelf?

   $_6P_6 = 6! = 720$ ways

6. A true-false test contains 8 questions. In how many different ways can the test be completed?

   $2^8 = 512$

7. A law firm is creating a committee of 9 members. 3 of the members are to be made up of the 7 senior members, 4 of the members are to be made up of the 6 junior members, and the remainder of the committee is to be made up of the 12 custodians. How many possible committees could be created by this firm?

   $\left(_7C_3\right) \cdot \left(_6C_4\right) \cdot \left(_{12}C_2\right)$

   34650

8. A state has registered 2 million automobiles. To simplify the license plate system, a state employee suggests that each plate display only two digits followed by three letters. Will this system create enough different license plates for all the vehicles registered? Explain why/why not.

   D_1 | D_2 | L_1 | L_2 | L_3
   10 | 10 | 26 | 26 | 26 $\quad = 1757600$ license plates

   No, there will not be enough license plates.

14

9. How many different 6 digit license plates of the same state can have the digits 3, 5, 5, 6, 2, and 6?

$$\frac{6!}{(2!\ 2!)} = 180$$

10. How many different three-digit whole numbers can be formed using the digits 1, 3, 5 and 7 if no repeating of digits is allowed?
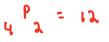
$$4! = 24$$

11. There are five women and six men in a group. From this group a committee of 4 is to be chosen. How many different ways can a committee be formed that contain three women and one man?

$$\left(_{11}C_3\right) \cdot \left(_8C_1\right) = 1320$$

12. The members of a string quartet composed of two violinists, a violist, and a cellist are to be selected from a group of six violinists, three violists, and two cellists, respectively. In how many ways can the string quartet be formed if one of the violinists is to be designed as the first violinist and the other is to be designated as the second violinist?

$$\left(_6P_2\right) \left(_9C_2\right) = 1080$$

13. How many ways are there to seat 4 couples on a bench in line at a restaurant?

$$_4P_2 = 12$$

14. A committee of 9- consisting of a chairman, vice-chairman, secretary and 6 other members-is to be chosen from a class of 30 students. In how many ways can this committee be chosen?

$$\left(_{30}P_3\right) \cdot \left(_{27}C_6\right)$$

$$7210\,803600$$