

Key

56 1.  ${}^8C_3 = \frac{8!}{5!3!}$

30 2.  ${}^6P_2 = \frac{6!}{4!}$

240 3.  ${}^4P_2 \cdot {}^{10}C_9 \cdot {}^5C_0 = \frac{4!}{1!3!} \cdot \frac{10!}{1!9!} \cdot \frac{5!}{5!0!}$

1024 4. Each question on a five-question multiple-choice quiz has answer choices labeled A, B, C, and D. How many different ways can a student answer the five questions?

$4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$

240 5. How many different ways can six different books be arranged on a shelf if one of the books is a dictionary and it must be on an end?

$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 \cdot 1$

10,080 6. In how many orders can eight actors be listed in the opening credits of a movie if the leading actor must be listed first or last?

$\frac{1}{\text{Dict.}} \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

151,200 7. Abby is registering at a Web site. She must select a password containing 6 numerals to be able to use the site. How

or  $7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 1$

many passwords are allowed if no digit may be used more than once?

$10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5$

88583040 8. How many different 3 letter, 4 digit license plates are there if letters can be repeated but the numbers can't?

$10 \cdot P_6$   
 $26 \cdot 26 \cdot 26 \cdot \frac{10}{\#} \cdot \frac{9}{\#} \cdot \frac{8}{\#} \cdot \frac{7}{\#}$

a. 90 9 a. How many numbers between 100 and 999, inclusive, have 7 in the tens place?

$\frac{9}{\#} \cdot \frac{1}{7} \cdot \frac{10}{\#}$

b. 90 b. Have 7 in the ones place?

$\frac{9}{\#} \cdot \frac{10}{\#} \cdot \frac{1}{7}$

c. 100 c. Have 7 in the hundreds place?

$\frac{1}{7} \cdot \frac{10}{\#} \cdot \frac{10}{\#}$

16 10. A coin is tossed four times. How many possible sequences of heads or tails are possible?

$2 \cdot 2 \cdot 2 \cdot 2$

210 11. How many ways can 4 identical pen sets and 6 identical watches be given to 10 graduates if each person receives one item?

$\frac{10!}{4!6!}$

4320 12. Three different hardcover books and five different paperbacks are placed on a shelf. How many ways can they be

arranged if all the paperback books are together?

$3 \cdot P_3 \cdot 6 \cdot P_6$

13. In how many ways can 9 people stand in a ring around the player who is "it"?

OMIT

14. In how many ways can 10 charms be placed on a bracelet with no clasp?

OMIT

