Algebra 2
Chapter 11 Probabilities Mixed Practice

Name: Key
Date: _____ **Period:** _____

1.) A box of jelly beans comes in 6 colors as shown in the table below. When you choose one jelly bean at random, what are the probabilities of the following outcomes?

Color	Black	Orange	Green	Red	Blue	Yellow
Number of Jelly Beans	55	35	40	30	60	55

275

a) $P(Orange) =$ $35/275$

b) $P(A\ DCHS\ school\ spirit\ color) =$ $90/275$

c) $P(Color\ that\ begins\ with\ the\ letter\ "B") =$ $115/275$

d) $P(Yellor\ or\ Green) =$ $95/275$

2.) Diamond has a collection of colored pens. She has a glass container has 4 red pens, 3 green pens, and 7 blue pens from which she will select <u>three</u> at random. Find the probability of the following outcomes.
Note: Assume that these are three separate events.

Total 14

a) $P(Red, Green\ \&\ then\ Blue$ ***with replacement***$)$

$$\frac{4}{14} \cdot \frac{3}{14} \cdot \frac{7}{14} = \boxed{\frac{84}{2744}}$$

b) $P(Blue, Green\ \&\ Red$ ***without replacement***$)$

$$\frac{7}{14} \cdot \frac{3}{13} \cdot \frac{4}{12} = \boxed{\frac{84}{2184}}$$

c) $P(3\ Blue\ Pens$ ***without replacement***$)$

$$\frac{7}{14} \cdot \frac{6}{13} \cdot \frac{5}{12} = \boxed{\frac{210}{2184}}$$

3.) Alijah draws from a standard 52-card deck. Find the following:

a) Single Event
$P(Drawing\ a\ red\ face\ card)$

$$\boxed{\frac{6}{52}}$$

b) Multiple Events, **without replacement**
$P(Drawing\ a\ red\ face\ card\ \&\ then\ drawing\ a\ 7)$

$$\frac{6}{52} \cdot \frac{4}{51} = \boxed{\frac{24}{2652}}$$

4.) A local bistro has a $20 meal deal. You select one from each of category. There are 3 appetizers to choose from, 6 entrees to choose from, and 2 desserts to choose from. How many different meals can you order?

$3 \cdot 6 \cdot 2 = \boxed{36\ meals}$

5.) How many possible passwords can be created if the password must be exactly 5 characters consisting of letters (A-Z) and numbers (0-9), with the first space being a letter and the last four spaces being numbers **with repeats allowed**?

$26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = \boxed{260{,}000 \text{ possible}}$

6.) How many possible passwords can be created if the password must be exactly 5 characters consisting of letters (A-Z) and numbers (0-9), with the first space being a letter and the last four spaces being numbers **with repeats not allowed**?

$26 \cdot 10 \cdot 9 \cdot 8 \cdot 7 = \boxed{131040 \text{ possible}}$

Questions # 7 – 11, identify whether the question can be answered using a permutation (P) or a combination (C). Then answer the question.

7.) How many different ways can you choose a group of 6 troops from a 24-person platoon?

$$\frac{24 \cdot 23 \cdot 22 \cdot 21 \cdot 20 \cdot 19}{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

Permutation / Combination (Circle one) **Number of ways:** 134,596

8.) The company your work for has ten members on its board of directors. In how many different ways can it elect a President, Vice-President, Secretary, and Treasurer?

$10 \cdot 9 \cdot 8 \cdot 7$

Permutation / Combination (Circle one) **Number of ways:** 5040

9.) How many different ways can a director select three actors from a group of 20 actors to attend a workshop on performing in rock musicals?

$$\frac{20 \cdot 19 \cdot 18}{3 \cdot 2 \cdot 1}$$

Permutation / Combination (Circle one) **Number of ways:** 1140

10.) What if the director in # 9 wanted to fill positions of lead actor, supporting actor, and an extra?

$20 \cdot 19 \cdot 18$

Permutation / Combination (Circle one) **Number of ways:** 6840

11.) From a club of 15 people, in how many ways can a group of seven members be selected?

$$\frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9}{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

Permutation / Combination (Circle one) **Number of ways:** 6435