CCGPS Analytic Geometry Probability Test Review 2

1. The math club is electing new officers. There are 4 candidates for president, 5 candidates for vice-president, 2 candidates for secretary, and 1 candidate for treasurer. How many different combinations of officers are possible?

2. A piggybank contains 2 quarters, 3 dimes, 4 nickels, and 5 pennies. One coin is removed at random.

   a) What is the probability that the coin is a dime?

   b) What is the probability that the coin is a dime **or** a nickel?

   c) What is the probability that you choose a nickel **and** then a nickel? (without replacement)

   d) What is the probability that the coin is not a quarter?

3. Each of the letters of the word "ALGEBRA " is on a separate card. The cards have been mixed and placed in a box. If you select one card at random, what is the probability that its letter will be "A"?

4. A card is randomly selected from a standard deck of 52 cards. Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

   a) P(Face card) $\frac{12}{52}$

   b) P(Ace or a Diamond)

   c) P(Black and Ace)

   d) P(Black card or Face card)

5. Two cards are randomly selected from a standard deck of 52 cards (WITH REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack and Heart)

b) P(Diamond and Diamond and Diamond)

c) P(Red and King)

d) P(Black card and Numbered card)

6. Two cards are randomly selected from a standard deck of 52 cards (**WITHOUT** REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack of Hearts and Heart)

b) P(Face card and Face card and Ace)

d) P(Black Card and Red King)

d) P(Black Jack and Numbered card)

7. The probability that a student plays tennis is 47%. The probability that a student plays tennis and Lacrosse is 16%. What is the probability that student plays Lacrosse, given that they play tennis?

8. The probability that a high school senior drives to school is .81. The probability that a high school senior having a job and driving to school is .52. What is the probability that high school senior will have a job, given that they drive to school?

For #9 - 13, refer to the following table.

	Male	Female	Subtotal
Blue Eyes	40	20	
Green Eyes	10	80	
Subtotal			

9) P (Male) =

10. P (Green Eyes) =

11.P(Green Eyes | Male) =

12. P(Male | Green Eyes) =

CCGPS Analytic Geometry Probability Test Review 2 Combinations

Key

1. The math club is electing new officers. There are 4 candidates for president, 5 candidates for vice-president, 2 candidates for secretary, and 1 candidate for treasurer. How many different combinations of officers are possible?

$4 \cdot 5 \cdot 2 \cdot 1 = 40$ combinations

2. A piggybank contains 2 quarters, 3 dimes, 4 nickels, and 5 pennies. One coin is removed at random.

a) What is the probability that the coin is a dime? $\frac{3}{14}$

b) What is the probability that the coin is a dime **or** a nickel? $\frac{3}{14} + \frac{4}{14} = \frac{7}{14}$ or $\frac{1}{2}$

c) What is the probability that you choose a nickel **and** then a nickel? (without replacement) $\frac{4}{14} \cdot \frac{3}{13} = \boxed{\frac{6}{91}}$

d) What is the probability that the coin is not a quarter? $\frac{12}{14} = \boxed{\frac{6}{7}}$

3. Each of the letters of the word "ALGEBRA " is on a separate card. The cards have been mixed and placed in a box. If you select one card at random, what is the probability that its letter will be "A"?

$\frac{2}{7}$

4. A card is randomly selected from a standard deck of 52 cards. Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Face card) $\frac{12}{52} = \boxed{\frac{3}{13}}$

b) P(Ace or a Diamond) $\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \boxed{\frac{4}{13}}$

c) P(Black and Ace) $\frac{2}{52}$ or $\boxed{\frac{1}{26}}$

looking for the overlap

d) P(Black card or Face card) $\frac{26}{52} + \frac{12}{52} - \frac{6}{52} = \frac{32}{52} = \boxed{\frac{8}{13}}$

5. Two cards are randomly selected from a standard deck of 52 cards (WITH REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack and Heart)

$\frac{4}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{52}}$

b) P(Diamond and Diamond and Diamond)

$\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{64}}$

c) P(Red and King)

$\frac{26}{52} \cdot \frac{4}{52} = \boxed{\frac{1}{26}}$

d) P(Black card and Numbered card)

$\frac{26}{52} \cdot \frac{36}{52} = \boxed{\frac{9}{26}}$

6. Two cards are randomly selected from a standard deck of 52 cards (**WITHOUT** REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack of Hearts and Heart)

$\frac{1}{52} \cdot \frac{12}{51} = \boxed{\frac{1}{221}}$

b) P(Face card and Face card and Ace)

$\frac{12}{52} \cdot \frac{11}{51} \cdot \frac{4}{50} = \boxed{\frac{22}{5525}}$

d) P(Black Card and Red King)

$\frac{26}{52} \cdot \frac{2}{51} = \boxed{\frac{1}{51}}$

d) P(Black Jack and Numbered card)

$\frac{2}{52} \cdot \frac{36}{51} = \boxed{\frac{6}{221}}$

0.47

7. The probability that a student plays tennis is 47%. The probability that a student plays tennis and Lacrosse is 16%. What is the probability that student plays Lacrosse, given that they play tennis?

0.16

$\frac{0.16}{0.47} = \boxed{0.34}$

8. The probability that a high school senior drives to school is .81. The probability that a high school senior having a job and driving to school is .52. What is the probability that high school senior will have a job, given that they drive to school?

$\frac{0.52}{0.81} = \boxed{0.64}$

For #9 - 13, refer to the following table.

	Male	Female	Subtotal
Blue Eyes	40	20	60
Green Eyes	10	80	90
Subtotal	50	100	150

9) P (Male) = $\frac{50}{150} = \frac{1}{3}$

10. P (Green Eyes) = $\frac{90}{150} = \boxed{\frac{3}{5}}$

denominators.

11. P(Green Eyes | Male) =

$\frac{10}{50}$ or $\boxed{\frac{1}{5}}$

12. P(Male | Green Eyes) = $\frac{10}{90} = \boxed{\frac{1}{9}}$

13) Male and Green eyes are dependant

$P(M|G) \neq P(G|M)$