Analytic Geometry Probability Review WS: Simple, Compound Probability and Compound Events Thurs 3/25/2015

1. A card is randomly drawn from a standard 52-card deck. Remember the 4 suits are {hearts, diamonds, clubs, and spades}, so there are 13 of each suit. A face card is a king, queen, or jack. Find the probability of each drawing each card given in the parenthesis.

a) P(Clubs)	b) P(numbered cards)	c) P(Diamonds or even cards)
d) P(Red Face cards)	e) P(King or Ace)	f) P(red or Jacks)
g) P(even cards)	h) P(Face cards or Odd numbered cards)	i) P(black and odd cards)
j) P(Face and Spades)	k) P(Red and Face Cards)	l) P (Hearts or Prime numbered cards)

2.

In a bag there are 3 red marbles, 2 yellow marbles, and 1 blue marble. After a marble is selected, it is replaced. Using this new situation, find the probability of each outcome listed above.

a) a red marble and then a yellow marble

b) a blue marble and then a yellow marble

c) a red marble and then a blue marble

d) any color marble except yellow and then a yellow marble

e) a red marble three times in a row

3) From a deck of 52 cards, multiple cards randomly chosen, one after another. Find the probability of the below events occurring if the cards are replaced after each selection:

Example: P(10, jack, 10) = 4/52 * 4/52 * 4/52 = **1 / 2197 or 0.000455**

a) P(black card , face card) =

b) P(Ace, Ace, Odd numbered card) =

c) P(Ace, Jack, Queen, King) =

d) P(Clubs, Diamonds, Hearts, Spades) =

e) P(Prime numbered card, Odd numbered card)

4. A jar contains 8 marbles: 3 black, 2 yellow, 2 blue, and 1 purple. Two marbles are drawn with replacement. What is the probability?

a) P(black and yellow) _____

c) P(yellow or purple, then blue) _____

b) P(black and blue) _____

Find the probability of each set of independent events.

5.

drawing a black checker from a bag of 6 black checkers and 4 red checkers, replacing it, and drawing another black checker

6.

Randy has 4 pennies, 2 nickels, and 3 dimes in his pocket. If he randomly chooses 2 coins, what is the probability that both are dimes?

Analytic Geometry Probability Review WS: Simple, Compound Probability and Compound Events Thurs 3/25/2015 Key

1. A card is randomly drawn from a standard 52-card deck. Remember the 4 suits are {hearts, diamonds, clubs, and spades}, so there are 13 of each suit. A face card is a king, queen, or jack. Find the probability of each drawing each card given in the parenthesis.

a) P(Clubs) $\frac{13}{52}$	b) P(numbered cards) $\frac{9}{52}$	c) P(Diamonds or even cards) 2 4 6 8 10 $\frac{13}{52}+\frac{20}{52}-\frac{5}{52}=\frac{28}{52}$
d) P(Red Face cards) $\frac{6}{52}$	e) P(King or Ace) $\frac{4}{52}+\frac{4}{52}$	f) P(red or Jacks) $\frac{13}{52}+\frac{4}{52}-\frac{2}{52}$
g) P(even cards) $\frac{15}{52}$	h) P(Face cards or Odd numbered cards) $\frac{12}{52}+\frac{16}{52}=\frac{28}{52}$	i) P(black and odd cards) $\frac{26}{52}+\frac{16}{52}-\frac{8}{52}$
j) P(Face and Spades) $\frac{12}{52}+\frac{13}{52}-\frac{3}{52}$	k) P(Red and Face Cards) $\frac{26}{52}+\frac{12}{52}-\frac{6}{52}$	l) P (Hearts or Prime numbered cards) 2 3 5 7 $\frac{13}{52}+\frac{16}{52}-\frac{4}{52}$

2.

In a bag there are 3 red marbles, 2 yellow marbles, and 1 blue marble. After a marble is selected, it is replaced. Using this new situation, find the probability of each outcome listed above.

6 total:

a) a red marble and then a yellow marble $\frac{3}{6}\cdot\frac{2}{6}$

b) a blue marble and then a yellow marble $\frac{1}{6}\cdot\frac{2}{6}$

c) a red marble and then a blue marble $\frac{3}{6}\cdot\frac{1}{6}$

d) any color marble except yellow and then a yellow marble $\frac{4}{6}\cdot\frac{2}{6}$

e) a red marble three times in a row $\frac{3}{6}\cdot\frac{3}{6}\cdot\frac{3}{6}$ $\left(\frac{1}{2}\right)^3=\boxed{\frac{1}{8}}$

3) From a deck of 52 cards, multiple cards randomly chosen, one after another. Find the probability of the below events occurring if the cards are replaced after each selection:

Example: P(10, jack, 10) = 4/52 * 4/52 * 4/52 = **1/2197 or 0.000455**

a) P(black card , face card) = $\frac{26}{52} \cdot \frac{12}{52}$

b) P(Ace, Ace, Odd numbered card) = $\frac{4}{52} \cdot \frac{4}{52} \cdot \frac{16}{52}$

c) P(Ace, Jack, Queen, King) = $\frac{4}{52} \cdot \frac{4}{52} \cdot \frac{4}{52} \cdot \frac{4}{52}$

d) P(Clubs, Diamonds, Hearts, Spades) = $\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52}$

e) P(Prime numbered card, Odd numbered card) $\frac{16}{52} \cdot \frac{16}{52}$

2 3 5 7

4. A jar contains 8 marbles: 3 black, 2 yellow, 2 blue, and 1 purple. Two marbles are drawn with replacement. What is the probability? total: 16

a) P(black and yellow) $\frac{3}{16} \cdot \frac{2}{16}$

c) P(yellow or purple, then blue) _____

$\frac{3}{16} \cdot \frac{2}{16}$

b) P(black and blue) $\frac{3}{16} \cdot \frac{2}{16}$

Find the probability of each set of independent events.

5. $\frac{6}{10}$

drawing a black checker from a bag of 6 black checkers and 4 red checkers, replacing it, and drawing another black checker

$\frac{6}{10} \cdot \frac{6}{10}$

6. 9 total

Randy has 4 pennies, 2 nickels, and 3 dimes in his pocket. If he randomly chooses 2 coins, what is the probability that both are dimes?

$\frac{3}{9} \cdot \frac{3}{9} = \left(\frac{1}{3}\right)^2 = \boxed{\frac{1}{9}}$