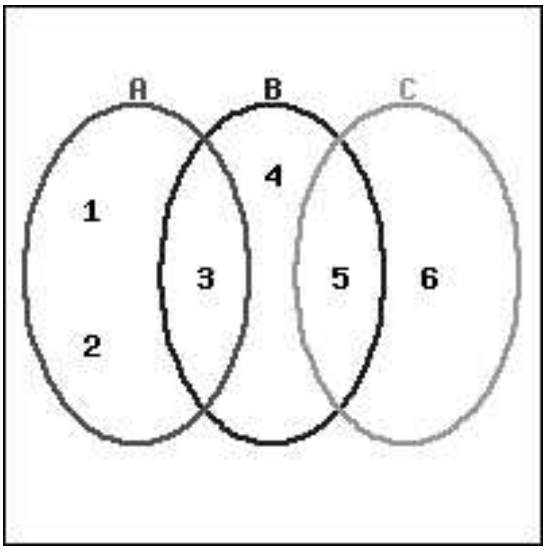
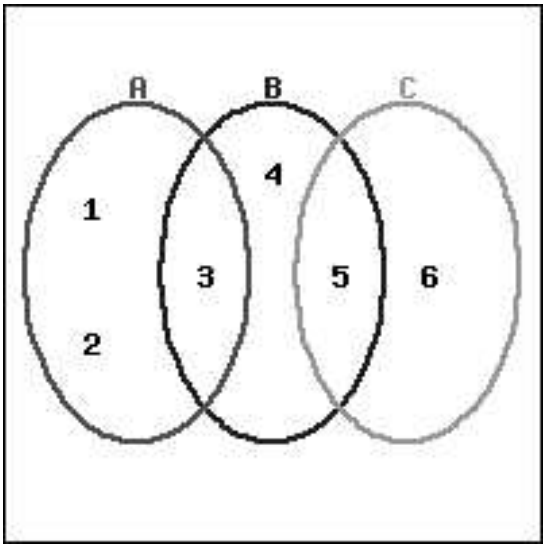
1.(1 pt)
If $P(A) = 0.4$, $P(B) = 0.8$, and $P(A \cap B) = 0.25$, then
(a) $P(A|B) =$ _____ and
(b) $P(B|A) =$ _____



2.(1 pt)
A sample space contains six sample points and events A, B, and C as shown in the Venn diagram. The probablities of the sample points are $P(1) = 0.1$, $P(2) = 0.4$, $P(3) = 0.1$, $P(4) = 0.15$, $P(5) = 0.2$, $P(6) = 0.05$.
Use the Venn diagram and the probabilities of the sample points to find:
(a) $P(B) =$ _____
(b) $P(C|B) =$ _____
(c) $P(B^c|A) =$ _____



3.(1 pt)
A sample space contains six sample points and events A, B, and C as shown in the Venn diagram. The probablities of the sample points are $P(1) = 0.1$, $P(2) = 0.4$, $P(3) = 0.3$, $P(4) = 0.05$, $P(5) = 0.1$, $P(6) = 0.05$.
Use the Venn diagram and the probabilities of the sample points to find:
(a) $P(\overline{B}) =$ _____
(b) $P(B|A) =$ _____
(c) $P(\overline{C}|A) =$ _____

4.(1 pt)
A box contains one yellow, two red, and three green balls. Two balls are randomly chosen without replacement. Define the following events:
A : { One of the balls is yellow }
B : { At least one ball is red }
C : { Both balls are green }
D : { Both balls are of the same color }
Find the following conditional probabilities:
(a) $P(A|B) =$ _____
(b) $P(B|D^c) =$ _____
(c) $P(C|A) =$ _____

5.(1 pt)
A box contains one yellow, two red, and three green balls. Two balls are randomly chosen without replacement. Define the following events:
A : { One of the balls is yellow }
B : { At least one ball is red }
C : { Both balls are green }
D : { Both balls are of the same color }
Find the following conditional probabilities:
(a) $P(A|B) =$ _____
(b) $P(\overline{B}|D) =$ _____
(c) $P(C|A) =$ _____

6.(1 pt)
"Channel One" is an educational television network for which participating secondary schools are equipped with TV sets in every classroom. It has been found that 40
% of secondary schools subscribe to Channel One, where of these subscribers 15
% never use Channel One while 30
%claim to use it more than 5 times per week.

Find the probability that a randomly selected seconday school subscribes to Channel One and uses it more than 5 times per week.

answer: _____

7.(1 pt)
Two fair dice, one blue and one red, are tossed, and the up face on each die is recorded. Define the following events:
E : { The difference of the numbers is 3 or more }
F : { The numbers are equal }

Find the following probabilities:

(a) $P(E) =$ _____

(b) $P(F) =$ _____

(c) $P(E \cap F) =$ _____

(d) $P(E|F) =$ _____

(e) $P(F|E) =$ _____

Are events E and F independent?

- A. yes
- B. no

8.(1 pt)

Two fair dice, one blue and one red, are tossed, and the up face on each die is recorded. Define the following events:

E : { The numbers are equal }

F : { The difference of the numbers is 3 or more }

Find the following probabilities:

(a) $P(E) =$ _____

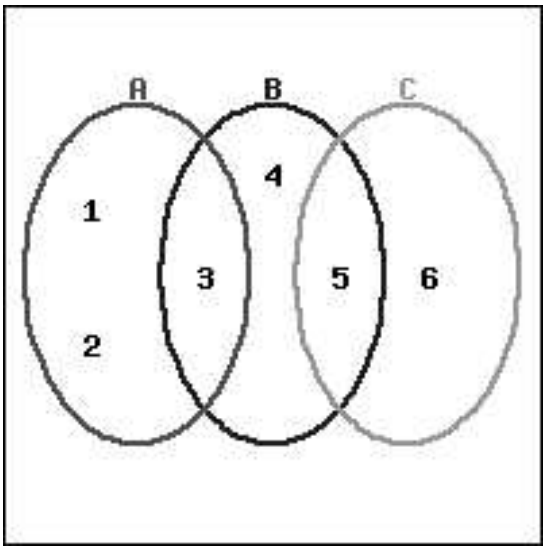
(b) $P(F) =$ _____

(c) $P(E \cap F) =$ _____

Are events E and F independent?

- A. no
- B. yes

9.(1 pt)



A sample space contains six sample points and events A, B, and C as shown in the Venn diagram. The probablities of the sample points are $P(1) = \frac{1}{12}$, $P(2) = \frac{1}{12}$, $P(3) = \frac{6}{12}$, $P(4) = \frac{1}{12}$, $P(5) = \frac{1}{12}$, $P(6) = \frac{2}{12}$.

Are events B and C mutually exclusive?

- A. Yes
- B. No

Use the Venn diagram and the probabilities of the sample points to find:

$P(A) =$ _____

$P(B) =$ _____

$P(A \cap B) =$ _____

Are events A and B independent?

- A. Yes
- B. No

10.(1 pt) Scoring a hole-in-one is the greatest shot a golfer can make. Once 7 professional golfers each made holes-in-one on the 5^{th} hole at the same golf course at the same tournament. It has been found that the estimated probability of making a hole-in-one is $\frac{1}{2176}$ for male professionals. Suppose that a sample of 7 professional male golfers is randomly selected.

(a) What is the probability that none of these golfers make a hole-in-one on the 10^{th} hole at the same tournament?

answer: _____

(b) What is the probability that all of these golfers make a hole-in-one on the 10^{th} hole at the same tournament?

answer: _____

11.(1 pt)

For two events A and B, $P(A) = 0.2$ and $P(B) = 0.6$.

(a) If A and B are independent, then

$P(A|B) =$ _____

$P(A \cap B) =$ _____

$P(A \cup B) =$ _____

(b) If A and B are dependent and $P(A|B) = 0.1$, then

$P(B|A) =$ _____

$P(A \cap B) =$ _____

12.(1 pt)

If $P(A) = 0.1$, $P(B) = 0.5$, and $P(A \cup B) = 0.6$, then

$P(A \cap B) =$ _____ .

(a) Are events A and B independent? (enter YES or NO) ___

(b) Are A and B mutually exclusive? (enter YES or NO) ___

13.(1 pt)

The number 37 is written as a sum of three natural numbers

$$37 = a + b + c$$

(the triple (a,b,c) is ordered; e.g., the decompositions $37 = 10 + 11 + 16$ and $37 = 11 + 16 + 10$ are different.

Also, assume that all the decompositions have equal probability.)

Given that there exists a triangle with sides a, b, and c, what is the probability that this triangle is isosceles? _____

14.(1 pt) What is the probability that at least one of a pair of fair dice lands of 2, given that the sum of the dice is 7?

_____

15.(1 pt) In a certain community, 32% of the families own a dog, and 25% of the families that own a dog also own a cat. It is also know that 37% of all the families own a cat.

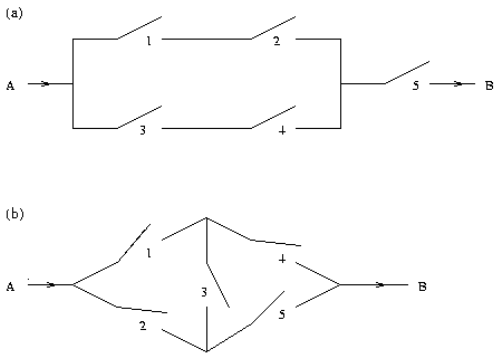
What is the probability that a randomly selected family owns a dog? _____

What is the conditional probability that a randomly selected family owns a dog given that it owns a cat? _____

16.(1 pt) Urn A has 10 white and 17 red balls. Urn B has 7 white and 4 red balls. We flip a fair coin. If the oucome is heads, then a ball from urn A is selected, whereas if the oucome is tails, then a ball from urn B is selected. Suppose that a red ball is selected. What is the probability that the coin landed heads?

_____

17.(1 pt) The probability of the closing of the ith relay in the circuits shown is given by p_i. Let $p_1 = 0.3$, $p_2 = 0.6$, $p_3 = 0.2$, $p_4 = 0.5$, $p_5 = 0.7$. If all relays function independently. what is the probability that a current flows between A and B for the respective circuits?



(a) $P =$ _____

(b) $P =$ _____