1. Why does P(A|B) = P(A) establish that event A and event B are independent?

2. If P(A|B) = P(A), then is it always true that P(B|A) = P(B)? Explain.

3. Determine whether these conditional statements are independent or not.

a) What is the probability of getting a blue color on the spinner, **GIVEN THAT** a head was flipped on a coin first?

Independent or Not Independent

b) What is the probability of getting a 6 on a die, **GIVEN THAT** 6 was selected from a deck of cards?

Independent or Not Independent

c) What is the probability of getting a green marble **GIVEN THAT** a green was selected first and not replaced?

Independent or Not Independent

d) What is the probability of getting a blue color on the spinner, **GIVEN THAT** it came up blue on the last spin?

Independent or Not Independent

e) What is the probability of getting a sum of 6 on two dice, **GIVEN THAT** the roll was doubles?

Independent or Not Independent

f) What is the probability of getting a yellow marble **GIVEN THAT** a green was selected first and was replaced?

Independent or Not Independent

4. Given that event A and B are independent and

a) P(A) = 0.4 and P(B) = 0.35, then P(A|B) = _____

b) P(A) = 0.76 and P(B) = 0.20, then P(A and B) = _____

c) P(A) = 0.25 and P(B) = 0.25, then P(B|A) = _____

5. Given that P(A) = 0.65 and that the P(A|B) = 0.5, what can you conclude about the events A and B?

6. Using substitution mathematically demonstrate why $P(A|B)=\frac{P(A\&B)}{P(B)}=P(A)$ **if the events A and B are independent.**

7. Given that event A and event B are independent, determine the required probabilities.

a) P(A and B) = 0.4
P(B) = 0.8

P(A) = _____

b) P(A|B) = 0.25
P(B) = 0.5

P(A) = _____

c) P(B|A) = 0.32
P(A) = 0.8

P(B) = _____

d) P(A) = 0.42
P(B) = 0.4

P(A and B) = _____

e) P(A|B) = 0.2
P(B|A) = 0.4

P(A and B) = _____

f) P(A) = 0.68
P(B) = 0.4

P(A|B) = _____

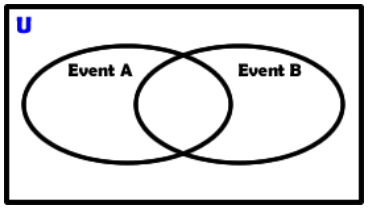
8. Determine the missing probabilities and if the two events are independent or not.

a) P(A and B) = 0.25

P(A) = 0.4

P(B) = 0.5

P(B|A) = _____



Are they independent?

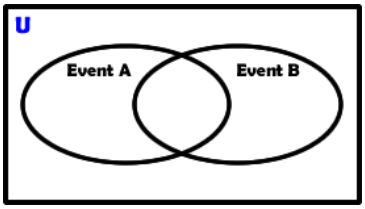
Yes or No

b) P(A and B) = 0.2

P(A) = 0.5

P(A or B) = 0.7

P(B) = _____



Are they independent?

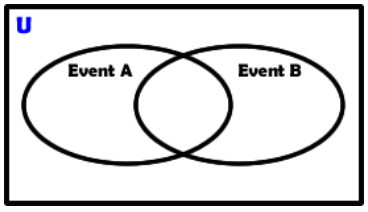
Yes or No

c) P(A and B) = 0.18

P(A not B) = 0.4

P(B not A) = 0.2

P(B|A) = _____



Are they independent?

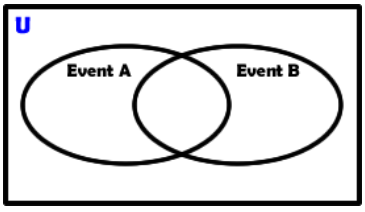
Yes or No

d) P(A and B) = 0.3

P(A) = 0.4

P(A or B) = 0.85

P(A|B) = _____



Are they independent?

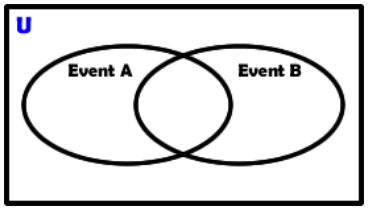
Yes or No

e) P(A or B) = 0.75

P(A)= 0.5

P(A and B) = .25

P(B|A) = _____



Are they independent?

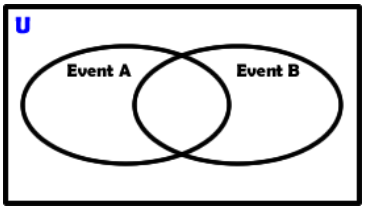
Yes or No

f) P(A or B) = 0.75

P(A)= 0.4

P(A and B) = .1

P(A|B) = _____



Are they independent?

Yes or No

9. 64% of women surveyed picked Urban Life (living in a city) over Rural Life (living in the country). If gender is independent of this choice, what can you conclude about the percentage of males that would Urban life?