1. After surveying math majors at a local university, Mr. Sullivan finds that 33% have a bicycle, 28% have a car, and 12% have both. Use a Venn Diagram to find the probability that a randomly selected student:

a. owns a bicycle and not a car.

b. owns neither a bicycle nor a car.

c. P(bicycle | car)?

d. owns a bicycle or a car, but not both

e. P(car | bicycle)?

f. Is taking owning a car independent of owning a bicycle? Justify!

2. We surveyed students and asked if they enrolled in two popular electives:

a. Draw a Venn Diagram that represents the probabilities in the table.

Electives

JROTC \ Band	Yes	No
Yes	0.12	0.35
No	0.18	0.35

b. Find P(Band | JROTC).

c. Find P(JROTC | Band).

d. P(Band).

e. What is the probability that a student is enrolled in EITHER a Band or JROTC, but not both?

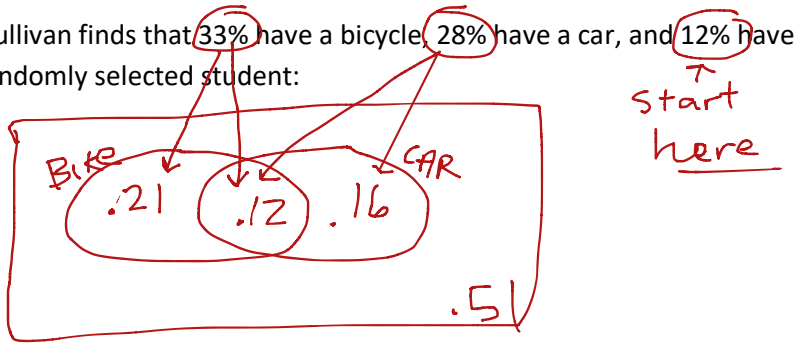
f. Is enrolling in band independent of enrolling in JROTC? Show why below.

12.2 Compound Probability

12.2 CA #2

Name:_____

1. After surveying math majors at a local university, Mr. Sullivan finds that 33% have a bicycle, 28% have a car, and 12% have both. Use a Venn Diagram to find the probability that a randomly selected student:



a. owns a bicycle and not a car.

0.21

b. owns neither a bicycle nor a car.

0.51

c. P(bicycle | car)?

Both → $\frac{0.12}{0.28} = 0.42857$

all "car" → 0.28

d. owns a bicycle or a car, but not both

0.21 + 0.16 = 0.37

e. P(car | bicycle)?

Both → $\frac{0.12}{0.33} = 0.3636$

all bike →

f. Is taking owning a car independent of owning a bicycle? Justify!

P(CAR) = P(CAR | BIKE)

0.28 = 0.3636

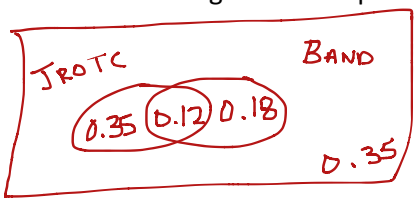
no. They would have to be equal to be independent.

2. We surveyed students and asked if they enrolled in two popular electives:

Electives

JROTC \ Band	Yes	No
Yes	0.12	0.35
No	0.18	0.35

a. Draw a Venn Diagram that represents the probabilities in the table.



b. Find P(Band | JROTC).

Both / JROTC = $\frac{0.12}{0.47} = 0.255$

c. Find P(JROTC | Band).

Both / Band = $\frac{0.12}{0.30} = 0.4$

d. P(Band). 0.30

e. What is the probability that a student is enrolled in EITHER a Band or JROTC, but not both?

0.35 + 0.18 = 0.53

f. Is enrolling in band independent of enrolling in JROTC? Show why below.

P(Band) = P(Band | JROTC)

0.30 ≠ 0.255

No!

Because P(Band) ≠ P(Band | JROTC), they are not independent.