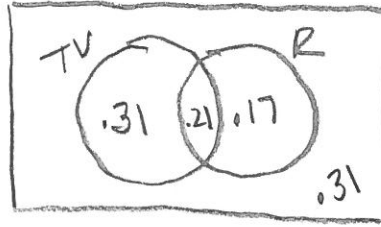


Statistics
Probability Review

Name _____

1. A check of dorm rooms on a large college campus revealed that 38% had refrigerators, 52% had TV's and 21% had both a TV and refrigerator.

a. Draw and label a Venn diagram.



b. Are the events has a TV and has a refrigerator independent?

$$P(T|R) = P(T) \quad \frac{.21}{.38} \neq .52 \quad \text{Not independent}$$

$$\frac{P(T \cap R)}{P(R)} = P(T)$$

c. What is the probability that a randomly selected dorm room has

- i. a TV but no refrigerator? .31
- ii. neither a TV or refrigerator .31
- iii. a TV or refrigerator but not both .48

d. What is the probability that a randomly selected dorm room has a TV given it has a refrigerator?

$$\frac{.21}{.38} = .55$$

2. A 1992 poll conducted at the University of Montana classified respondents by sex and political party, as shown in the table.

	Democrat	Republican	Independent	
Male	36	45	24	105
Female	48	33	16	97
				<u>202</u>

a. What is the probability that the respondent was a female?

$$\frac{97}{202} = .48$$

b. What is the probability that the respondent was a female, given they were a Democrat?

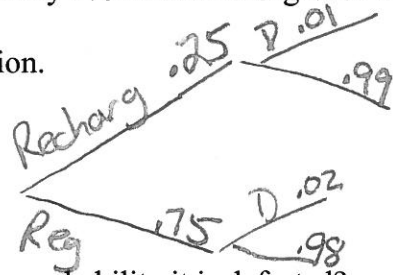
$$\frac{48}{84} = .57$$

c. What is the probability that the respondent was a Republican, given they were male?

$$\frac{45}{105} = .43$$

3. A factory produces two types of batteries, regular and rechargeable. Rechargeable batteries make up 25% of the company's production. Quality inspection tests show that 2% of the regular batteries come off the manufacturing line with a defect while only 1% of the rechargeable batteries have a defect.

a. Make a tree diagram of the above information.



b. If a battery is selected at random what is the probability it is defected?

$$.25(.01) + .75(.02) = .0175$$

c. If a battery is selected at random is defected, what is the probability it is a rechargeable battery?

$$\frac{.25(.01)}{.0175} = .143$$

4. The following probability distribution describes the number of repair calls that an appliance repair shop may receive during an hour.

# of calls, X	0	1	2	3
P(X)	0.1	0.3		0.2

a. What is P(2)? .4

b. What is the probability that more than 1 repair call will occur during an hour? .6

c. What is the probability that at most 2 repair calls will occur during an hour? .8

5. Police estimate that 80% of drivers wear seat belts. They set up a safety roadblock, stopping 120 cars to check for seat belt use. Assume each car stopped is independent of the other cars stopped. What is the probability:

a. Exactly 100 cars are using seat belts? $n=120$ $K=100$ $p=.8$

$$.063$$

b. At most 90 cars are using seat belts? $n=120$ $LB=0$ $UB=90$ $p=.8$

$$.1067$$

c. More than 75 cars are using seat belts? $n=120$ $LB=76$ $UB=120$ $p=.8$

$$.999$$

d. Between 50 and 100 cars are using seat belts? $n=120$ $LB=51$ $UB=99$ $p=.8$

$$.785$$