QUIZIZZ

NAME : _____

CLASS : _____

DATE : _____

AP Statistics Probability Rules
13 Questions

$P(A) = .57$ $P(B) = .80$

1. In an AP Statistics class, 57% of students eat breakfast in the morning, 80% of them floss their teeth, and 46% of the students do both. What is the probability that a randomly chosen student eats breakfast or flosses their teeth?

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
$= .57 + .80 - .46$

- A 34%
- B 91%
- C 9%
- D 11%

2. Five juniors and four seniors have applied for two open student council positions, and administrators have decided to pick two new members randomly. What is the probability that they are both from the same grade?

$\Rightarrow$ Probability of 2 juniors OR 2 seniors

$= \frac{5}{9} \cdot \frac{4}{8} + \frac{4}{9} \cdot \frac{3}{8}$

J J   S S

(Sampling without replacement)

- A .569
- B .506
- C .395
- D .444

3. A fair coin has come up "heads" 10 times in a row. The probability that the coin will come up heads on the next flip is: Flips are independent

- A greater than 50%, it's due to happen.
- B Can't be determined
- C less than 50%, since tails is happening so much.
- D 50%

4. According to the National Telecommunication and Information Administration, 50.5% of U.S. households had internet access in 2001. What is the probability that four randomly selected U.S. all had internet access in 2001? $P = .505$

- A 49.5%
- B 12.6%
- C 50.5%
- D 6.5%

$(.505)(.505)(.505)(.505) =$
↑
had
access

AND $\Rightarrow$ multiply

?

5. Pepsi is running a sales promotion in which 12% of all bottles have a "FREE" logo under the cap. If you buy a 6-pack of bottles, what is the probability that you will find at least 1 "FREE" logo?

Find probability of no free logos: $(.88)(.88)(.88)(.88)(.88)(.88)$

$= (.88)^6$

A	.12	B	0	
C (circled)	.536	D	.464	

$P(\text{at least } 1) = 1 - P(\text{none})$
$= 1 - .88^6$

6. Political analysts estimate the probability that Hillary Clinton will run for president in 2008 is 45%, and the probability that NY's Governor George Pataki will run as the Republican candidate is 20%. If their political decisions are independent, what is the probability that only Hillary runs for president?

→ *What one decides does not affect the other)*

If independent $P(A \cap B) = P(A) \cdot P(B)$

A	9%	B	25%
C	11%	D (circled)	36%

$P(\text{only Hillary runs}) = P(\text{Hillary runs AND Pataki doesn't}) = (.45)(1-.20)$

7. A bicycle shop equips 60% of its bikes with a water bottle holder, and 55% of its bikes are equipped with a kick stand. 34% of the bikes have both features. What is the probability that a randomly chosen bike has a kick stand GIVEN THAT it has a water bottle holder?

conditional → $P(A|B) = \dfrac{P(A \cap B)}{P(B)}$

A	81%	B	61.8%
C	34%	D (circled)	56.7%

$P(\text{Kick stand} | \text{bottle}) = \dfrac{.34}{.60}$

8. The probability of a tourist visiting an area cave is .7, and of a tourist visiting a nearby park is .6. The probability of visiting both places on the same day is .4. The probability that a tourist visits at least one of these two places is:

$P(\text{cave OR park}) = P(\text{cave}) + P(\text{park}) - P(\text{both})$

A	.28	B	.42
C (circled)	.9	D	.08

$= .7 + .6 - .4$
$= .9$

9. 100 people were surveyed. 54 were female, and 46 were male. 33 of the females said they were democrats, and 30 of the males said they were republicans. If a person is randomly selected, what is the probability that its a democrat?

A	46%	B	54%
C (circled)	49%	D	51%

	Dem	Rep	
Female	33	21	54
Male	16	30	46
	49	51	100

$\dfrac{49}{100}$

10. 100 people were surveyed. 54 were female, and 46 were male. 33 of the females said they were democrats, and 30 of the males said they were republicans. If a person is randomly selected, what is the probability that its a democrat GIVEN THAT it is a female?

| A | .33 |
| C | .67 |

| B | .61 |
| D | .49 |

Handwritten: Conditional. Only look at females ⇒ $\frac{33}{54}$

	D	R	
F	33	21	54
m	16	30	36

11. 100 people were surveyed. 54 were female, and 46 were male. 33 of the females said they were democrats, and 30 of the males said they were republicans. If two people are randomly selected, what is the probability they are both males?

| A | .30 |
| C | .25 |

| B | .46 |
| D | .21 |

Handwritten: $\frac{46}{100} \cdot \frac{45}{99}$ 1st is male AND 2nd is male

12. 100 people were surveyed. 54 were female, and 46 were male. 33 of the females said they were democrats, and 30 of the males said they were republicans. If a person is randomly selected, what is the probability a male is chosen GIVEN THAT its a republican?

| A | .41 |
| C | .35 |

| B | .59 |
| D | .65 |

Handwritten: Only look at republicans $\frac{30}{51}$

	D	R	
F	33	21	
M	16	30	
	49	51	

13. 100 people were surveyed. 54 were female, and 46 were male. 33 of the females said they were democrats, and 30 of the males said they were republicans. Are the events "male" and "republican" independent?

| A | No. P(male) = .46, but P(male|republican) =.59 |
| B | Yes. Knowing a person is republican provides no insight into gender in this survey. |

Handwritten: No. Men in this survey are far more likely to be republican than women in this survey.

Answer Key

1.b	2.d	3.d	4.d
5.c	6.d	7.d	8.c
9.c	10.b	11.d	12.b
13.a			