

Key

Date: \_\_\_\_\_

**Conditional Probability**

	MABE	REEVES	ADAMS	JONES	
MALE	50	35	20	5	110
FEMALE	40	30	25	15	110
	90	65	45	20	220

STUDENTS AT SOUTH STOKES HIGH WERE ASKED TO CHOOSE THEIR FAVORITE TEACHER. THE RESULTS ARE IN THE TABLE.

1.  $P(\text{male}|\text{Mabe})$

$$\frac{50}{90} = \frac{5}{9}$$

2.  $P(\text{male} \cap \text{Mabe})$

$$\frac{50}{220} = \frac{5}{22}$$

3.  $P(\text{male} \cup \text{Mabe})$

$$\frac{150}{220} = \frac{15}{22}$$

4.  $P(\text{Reeves}|\text{female})$

$$\frac{30}{110} = \frac{3}{11}$$

5.  $P(\text{Reeves} \cap \text{female})$

$$\frac{30}{220} = \frac{3}{22}$$

6.  $P(\text{Reeves} \cup \text{female})$

$$\frac{145}{220} = \frac{29}{44}$$

7.  $P(\text{Adams}|\text{male})$

$$\frac{20}{110} = \frac{2}{11}$$

8.  $P(\text{Adams} \cap \text{male})$

$$\frac{20}{220} = \frac{1}{11}$$

9.  $P(\text{Adams} \cup \text{male})$

$$\frac{135}{220} = \frac{27}{44}$$

10.  $P(\text{male}|\text{Jones})$

$$\frac{5}{20} = \frac{1}{4}$$

11.  $P(\text{Jones}|\text{male})$

$$\frac{5}{110} = \frac{1}{22}$$

**CONDITIONAL PROBABILITY**

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

12. The probability of Sarah tutoring and buying a milkshake is 35%. The probability of Sarah tutoring is 97%. What is the probability of Sarah buying a milkshake **given** that she is tutoring?

$$P(\text{buy milkshake}|\text{tutor}) = \frac{.35}{.97} = 0.36 \Rightarrow 36\%$$

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

13. The junior class is 49% male and 17% are males who are in the band. Find the probability of a student in the junior class being in the band given that he is male.

$$P(A|B) = \frac{.17}{.49} = 0.35 = 35\%$$

14. The probability of Luke playing Little League baseball and being on the middle school baseball team is 68%. The probability of Luke playing Little League baseball is 73%. What is the probability of Luke being on the middle school baseball team given that he plays Little League?

$$P(A|B) = \frac{.68}{.73} = 0.93 = 93\%$$

15. The probability that Josh will spray for bugs is 97%. The probability that there will be ants in the kitchen and Josh has sprayed for bugs is 23%. What is the probability of ants given that Josh has already sprayed for bugs?

$$P(A|B) = \frac{.23}{.97} = 0.24 = 24\%$$

16. Laurel is a six month old baby and the probability of her taking an evening nap is 55%. The probability of Laurel sleeping through the night given that she took an evening nap today is 53%. What is the probability of Laurel taking an evening nap and then sleeping through the night?

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)} \quad .53 = \frac{x}{.55} \quad x = 29\%$$

**WHAT HAS 13 HEARTS AND NO OTHER ORGANS?**

	<u>A</u>	<u>D</u>	<u>E</u>	<u>C</u>	<u>K</u>	<u>O</u>	<u>F</u>						
	2	5	11	14	10	7	3						
<u>P</u>	<u>L</u>	<u>A</u>	<u>Y</u>	<u>I</u>	<u>N</u>	<u>G</u>	<u>C</u>	<u>A</u>	<u>R</u>	<u>D</u>	<u>S</u>	<u>!</u>	
13	8	2	12	9	4	15	14	2	16	5	1	6	

E 4.5%	L 9%	D 14%	O 18%	A 23%	G 24%	K 25%	N 27%
R 29%	P 35%	Y 36%	S 56%	I 61%	! 66%	F 68%	C 93%