Name: Date: Period:

Probability Homework

1. A survey was done of students in a high school to see if there was a connection between a student's hair color and her or his eye color. If a student is chosen at random, find the probability of each of the following events.

		Hair Color			
		Black	Blond	Red	Total
Eye Color	Blue	0.15	0.20	0.05	0.40
	Brown	0.25	0.10	0.00	0.35
	Green	0.05	0.05	0.15	0.25
	Total	0.45	0.35	0.20	1.00

a) The student had black hair. .45

b) The student had blue eyes. .40

c) The student had brown eyes **and** black hair. .25

d) The student had blue eyes **or** blond hair (be careful!) P(Blue) + P(Blond) − P(Blue & Blond)

Shown on table .40 + .35 − .20 = .55

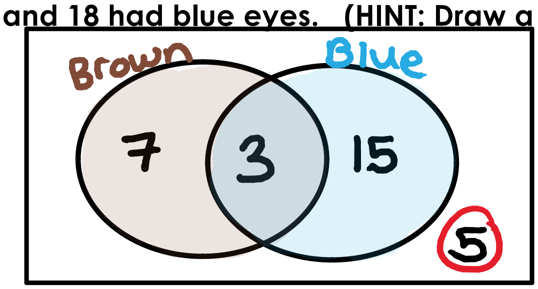
e) The student had black hair **or** blue eyes (be careful!) .70

f) **Given** that the student has black hair, what is the probability that they have green eyes? $\frac{.05}{.45} = .11$

g) **Given** that the student has brown eyes, what is the probability that they have blond hair?

$\frac{.10}{.35} = .28$

2. Mr. Lion was doing a science fair project by surveying his class. He found that of the 30 students in the class, 3 had brown hair and blue eyes, 10 had brown hair, and 18 had blue eyes. (HINT: Draw a Venn Diagram or two-way table for this problem)



a) How many people had brown hair OR blue eyes?

7 + 3 + 15 = 25

b) What is the **probability** that a person chosen at random has brown hair OR blue eyes?

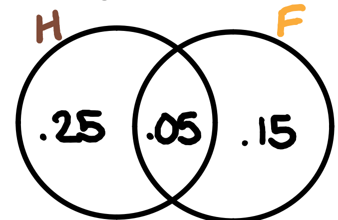
25/30

c) What is the **probability** that a person chosen at random has neither brown hair nor blue eyes?

5/30

3. The probability that a customer order a hamburger is 0.3. The probailbity that the customer orders french fries is 0.2. The probability that the customer orders both a hamburger and fries is 0.05. What is the probability that a customer orders a hamburger or french fries?

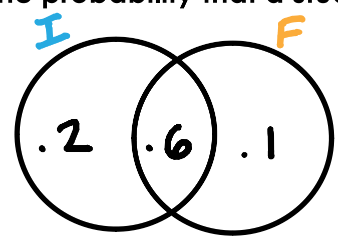
$$P(H \text{ OR } F) = P(H) + P(F) - P(H \text{ AND } F)$$
$$= .3 + .2 - .05$$
$$= .45$$



.25
.05
.15
.45

4. The probability that a student likes ice cream is 0.8. The probability that a student likes French fries is 0.7, and the probability that a student likes both is 0.6. What is the probability that a student likes ice cream or French fries?

$$P(I \text{ OR } F) = P(I) + P(F) - P(I \text{ AND } F)$$
$$= .8 + .7 - .6$$
$$= .9$$



.2
.6
.1
.9

5. Pat rolls a six-sided dice and flips a coin.

a) Are these events independent? Explain:

Yes, they do not have an effect on one another

b) What is the probability that he flips a heads? $\frac{1}{2}$

c) What is the probability that he lands on 6? $\frac{1}{6}$

d) What is the probability that he lands on 6 AND flips a heads? → $\frac{1}{6} \cdot \frac{1}{2} = \frac{1}{12}$

multiple events → means multiply!

e) What is the probability that he lands on a number greater than 4 and flips tails? $\frac{2}{6} \cdot \frac{1}{2} = \frac{2}{12} = \frac{1}{6}$

f) What is the probability the he lands on an even number and flips heads?

$$\frac{3}{6} \cdot \frac{1}{2} = \frac{3}{12} = \frac{1}{4}$$

6. The probability that someone wants to vote for Larry is $\frac{1}{2}$. The probability that someone wants to vote for Smith is $\frac{1}{3}$. The probability that someone wants to vote for Barry is $\frac{1}{6}$. Assume that all voting happens independently.

a) What is the probability that the first person votes for Larry and the second person votes for Smith?

→ multiply

$$P(\text{Larry}) \cdot P(\text{Smith})$$
$$\frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$$

b) What is the probability that the first three people vote for Smith?

$$P(\text{smith}) \cdot P(\text{smith}) \cdot P(\text{smith})$$
$$\frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} = \frac{1}{27}$$

c) What is the probability that the first person votes for Larry, the second person votes for Smith, and the third person votes for Barry?

$$P(\text{Larry}) \cdot P(\text{smith}) \cdot P(\text{Barry})$$
$$\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{6} = \frac{1}{36}$$