Homework Review - 13.4

(10) B I O L O G Y

A: O

B: B

$$P(A \text{ and } B) = P(A) \cdot P(B \text{ given } A)$$

$$P(X) = \frac{\text{the \# of ways X could happen}}{\text{the total \# of things that could happen}}$$

$$\frac{2}{7} \cdot \frac{1}{6} = \frac{2}{42} = \frac{1}{21}$$

18

$$P(A) + P(B) = 1$$

$$.70 + P(B) = 1$$

$$P(B) = .30$$

(14) $P(A \text{ or } B) = \frac{17}{32}$

$A = P(\text{Black piece}) = 16$

$B = P(\text{Queen}) = 2$

Both $= 1$

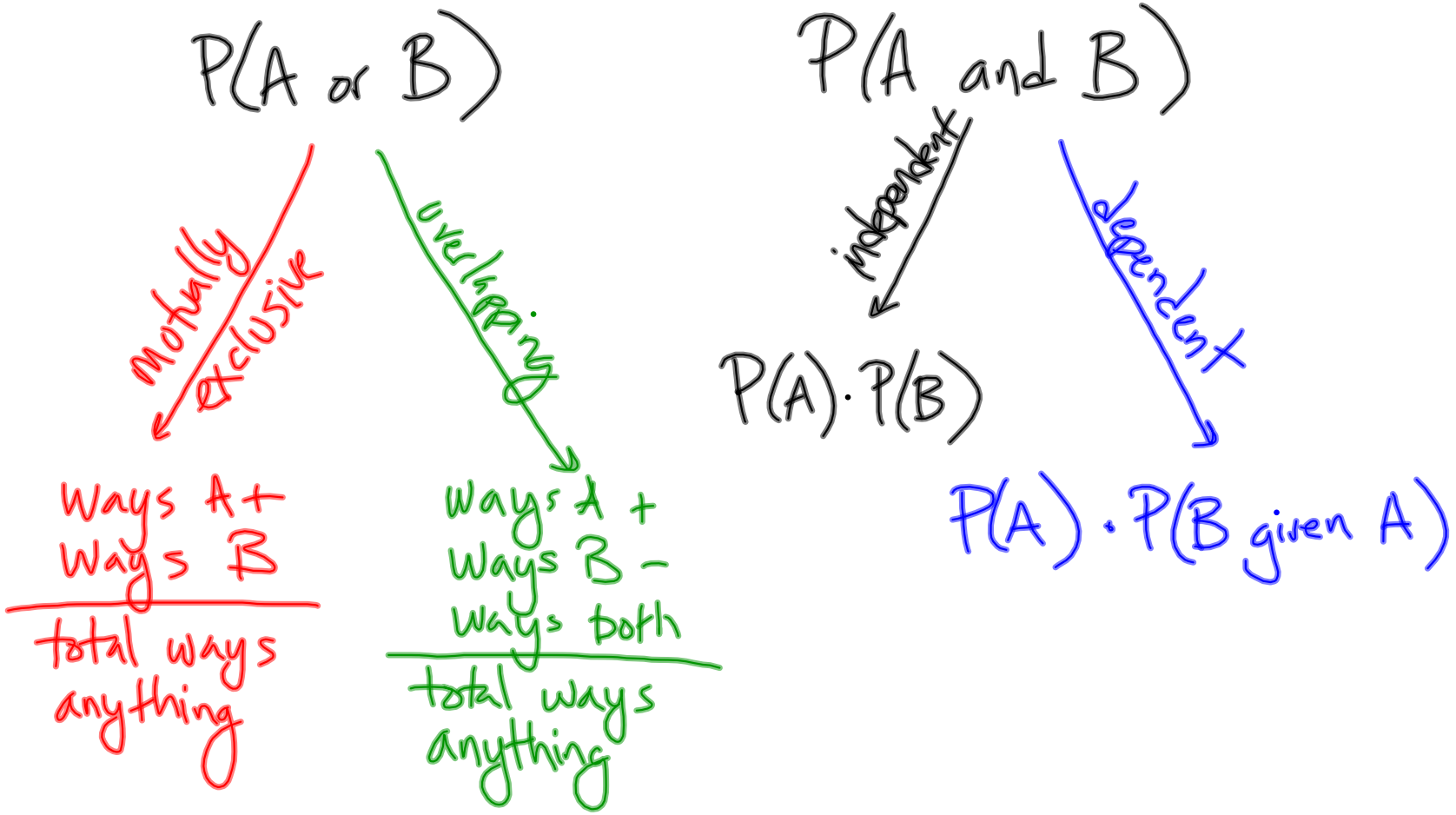
$16 + 2 - 1 = 17$

(16) $P(A \text{ and } B) = P(A) \cdot P(B \text{ given } A)$

A = King $\frac{2}{32} = \frac{1}{16}$

B = pawn $\frac{16}{31}$

$$\frac{1}{\cancel{16}} \cdot \frac{\cancel{16}}{31} = \frac{1}{31}$$


P(A or B)
mutually exclusive
overlapping
Ways A +
Ways B
total ways
anything
Ways A +
Ways B −
ways both
total ways
anything
P(A and B)
independent
dependent
P(A) · P(B)
P(A) · P(B given A)

(12) $P(A) = \frac{4}{10} = \frac{2}{5}$

$P(B \text{ given } A) = \frac{3}{9} = \frac{1}{3}$

$\frac{2}{5} \cdot \frac{1}{3} = \frac{2}{15}$

(24)

1000 households
250 dog
300 cat
100 both

$\frac{100}{1000} = \frac{1}{10}$

P(A or B)

A – 250
B – 300
both – −100
450

$\frac{450}{100} = \frac{45}{100} = \frac{9}{25}$

Analyzing Surveys and Samples

A set of questions ← Survey

The group of people we're interested in ← Population

A smaller group of people drawn from the population ← Sample

- Sample chosen randomly ← Random Sample
- first create groups, then choose randomly ← Stratified Random Sample
- a rule determines who's in the sample ← Systematic Sample
- Sample is chosen based on the surveyor's convenience ← Convenience Sample
- Anyone can choose to respond ← Self-Selected Sample

Classify a Sample Type:

Your school's administrators want to know if students are satisfied with the choices of activities for activity period. In each grade, every seventh student in alphabetical order is surveyed.

stratified/systematic/random

Biased Samples

the sample population is likely to answer the questions in a predictable way

Biased samples are not representative of the population

How can you tell?

Biased Questions

the way the question is phrased makes it more likely to get certain responses

Biased questions encourage or discourage specific responses

How can you tell?

Tell whether the survey method used is likely to result in a biased sample.

3. A bicycling club wants to gather information about biking conditions throughout a city. A survey for bicycle riders is posted on the club's website.

No (unbiased)

In Exercises 5 and 6, tell whether the question is potentially biased. *Explain* your answer.

5. Don't you think that the lunch menu should include grilled chicken rather than pizza because grilled chicken is healthier for you? BIASED

6. Do you think that the city's excess revenue should be spent on road repairs or building a new sports stadium? UNBIASED

Measures of Central Tendency

Add values & divide by number of values (n) ← Mean (Average)

the value that falls in the middle of a list of values ← Median

The most common value ← Mode

Find the mean, median, and mode(s) of the data.

1. 6, 1, 3, 8, 5, 11, 1, 5

2. 60, 81, 52, 75, 59, 81

3. 15, 27, 10, 25, 9, 22, 25

4. 23, 6, 8, 14, 28, 8, 13, 28

Measures of Dispersion

Largest value − Smallest value

Range

Mean absolute deviation

$(\bar{x} = \text{mean})$

$$\text{mean absolute deviation} = \frac{|\bar{x} - x_1| + |\bar{x} - x_2| + \ldots + |\bar{x} - x_n|}{n}$$

Find the range and mean absolute deviation of the data. Round to the nearest hundredth, if necessary.

13. 10, 7, 13, 10, 8

$13 - 7 = 6$

$\bar{x} = 9.6$

$$\frac{0.4 + 2.6 + 3.4 + 1.4 + 1.6}{5}$$

$$\frac{9.4}{5} = 1.7$$

14. 110, 114, 104, 108, 106

10

108.4

$$\frac{1.6 + 5.6 + 4.4 + .4 + 2.4}{5}$$

Homework:

p. 874, 3-11 odd, 15, 16

p. 877, 3-8 all, 11, 13, 20