Before we begin, are there any questions from last day's work?

pp.73-75 #3, 4, 5, 6, 8, 9, 11*, 12

(*For #11, you need the formula for the area of a circle: A= πr^2)

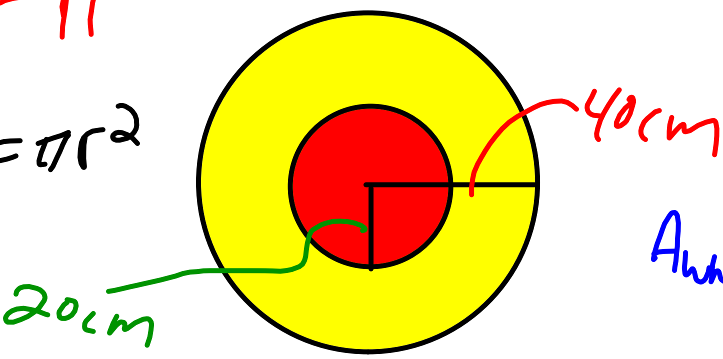
Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) distinguish between experimental and theoretical probability
- b) correctly use 5 terms from the word wall

p.75 #11

$A = \pi r^2$



$A_{red} = \pi r^2$

$= \pi (20)^2$

$\doteq 1256.63$ cm^2

$P(red) = \frac{1256.63}{5026.54}$

$\doteq 0.24$

$A_{whole\ Board} = \pi r^2$

$= \pi (40)^2$

$\doteq 5026.54$

$A_{yellow} = A_{Blue} - A_{red}$

$\doteq 5026.54 - 1256.63$

$\doteq 3769.9$

p.75 #12

Bass	Carp	Catfish	Total
20	25	15	60

a) $P(\text{catfish}) = \frac{15}{60}$

$= \frac{3}{12}$

$= \frac{1}{4}$

b) $P(\text{bass or carp}) = \frac{20+25}{60}$

$= \frac{45}{60}$

$= \frac{3}{4}$

or

$P(\text{bass or carp})$

$= 1 - P(\text{catfish})$

$= 1 - \frac{1}{4}$

$= \frac{3}{4}$

c) $P(\text{carp if } \underline{\text{NOT}} \text{ BASS})$

$= \frac{25}{40}$

$= \frac{5}{8}$

$= 0.625$

MBF3CI Date: Sept. 27/17

2.3 Compare Experimental and Theoretical Probabilities

Remember:

Experimental probability = $\frac{\text{number of trials with successful outcomes}}{\text{number of trials}}$

and

Theoretical probability = $\frac{\text{number of successful outcomes}}{\text{number of possible outcomes}}$

A **simulation** is an imitation of a real-life event.
A simulation is useful to predict future events, and theoretical probabilities!

We have done two simulations so far: coin lip and the RRRoll-Up-the-Rim.
Let's do the coin lip simulation again and summarize the results here: launch Fathom

# Trials = 10	# Trials = 100	# Trials = 25 000
P(Heads) = $\frac{6}{10}$ = 60%	P(Heads) = $\frac{46}{100}$ = 46%	P(Heads) = $\frac{12305}{25000}$ ≐ 49.22

Note: As the we increased the number of trials in the simulation (experiment), the *experimental* probability gets closer and closer to the **theoretical** probability.

Unprocessed information collected for a statistical study is called **raw data**.
Information that has been processed is called a **statistic.**

Examples of raw data		*A statistic for the example*
⇓		⇓
birth dates	→	average age of students in the class
marks in the class	→	class "***average***" mark (mean, median, or mode)

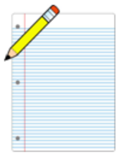
The discipline of **statistics** involves the gathering, organizing, analyzing, and displaying of raw data or data.

How might one use statistics at Huron Heights?

- average number of skipped classes
- determining if our school is AAA or AAAA for sports
- number of teachers, buses, course offerings

event
experimental probability
Law of Large Numbers
outcome
raw data
simulation
statistic
statistics
theoretical probability
trial

WORD WALL



Using the list of terms from the word wall, complete the sentences that follow.
One or more terms (on the list) may not be used. ***Use pencil only.***

Pretend for a moment that it is **dificult** to ind out what the theoretical probability of tossing a coin and getting "Heads" is!

To estimate a theoretical probability of any event, such as the theoretical probability of tossing a coin and getting "Heads", we *irst* conduct a simulation to determine an experimental probability.

Since we learned about the Law of Large Numbers, we shouldn't perform only 10 trials. Not even 100 trials or 500 trials are enough. If we could lip the coin a billion times, we would. However, the computer simulation we did had 25000 trials at a time.

Suppose the *experimental* probability that we get is: $\frac{12625}{25000}$

This is because the computer counted 12625 "Heads" in 25000 trials, which evaluates to about 50.5%.

The computer counted 12625 "Heads", or 12625 pieces of raw data.

This means that 12375 were "Tails".
The experimental probability is also a statistic,
since it is a calculation processed from raw data.

From this we conclude that P("Heads") = $\frac{1}{2}$,

which is the **theoretical** probability of lipping a coin and getting "Heads".

There is an extra example on the next page.

After we take up this worksheet, complete:
pp. 82-85 #1 - 6, 11, 13, 14

Ex. Poker chips are randomly drawn from a bag containing:
4 Red, **2 Green**, and **8 Blue** poker chips.

In 19 trials, (with replacement) the following draws occurred:
9 Red, **7 Green**, and **3 Blue**

Determine each probability as a fraction in lowest terms, as a decimal, and as a percent:

a) Theoretical P(**Green**)

$= \frac{2}{14}$

$= \frac{1}{7}$

$\doteq 0.142$

$\doteq 14.2\%$

b) *Experimental* P(**Green**)

$= \frac{7}{19}$

$\doteq 0.368$

$\doteq 36.8\%$

c) Theoretical P(**Blue**)

$= \frac{8}{14}$

$= \frac{4}{7}$

$\doteq 0.571$

$\doteq 57.1\%$

Attachments

- 2.ftm
- 2.ftm