Present today: #19, 25, 33

9:55 Megan Mi., Katie, Alyssa, Nicole, Rachel, Hannah Ro.
11:00 Rebecca Pr., Emma, Jamie, Erin, Jamie, Victoria Sc.

Homework:

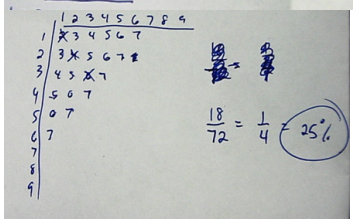
11.4 #1-7 odd, 13, 15, 21-28
12.4 #1-8, 10

No HW presentations; I'll answer questions on Monday.

After reviewing the correct solution (below), write your score on the back of your quiz.

0 = no progress at all; just rewrote problem
0.5 = false start, not based on relevant principles
1 = false start, but sustained effort with some relevant principles
1.5 = significant mistake(s), or significant misunderstanding(s)
2 = mistake near the end or could not finish; also excessive reliance on calculator or 'brute force' methods
2.5 = trivial mistake (e.g. arithmetic error), but work is mostly correct
3 = correct answer and work

Nine numbered poker chips (1, 2, 3, 4, 5, 6, 7, 8, 9) are placed in a jar, and two chips are drawn randomly and without replacement. Let E be the event that the sum of the two chips is less than 8. Calculate P(E).



Some New Notation
(Conditional Probabilities)

This conditional probability notation is used to define what it means for two events to be **independent**:

Events A and B are **independent** if $P(B \mid A) = P(B)$

Example: Draw one card from a 52-card deck. Let A be the event that you drew a **heart** , and let B be the event that you drew a **four**. Are A and B independent? yes

$P(B|A) = \frac{1}{13}$ $\stackrel{?}{=}$ $P(B) = \frac{4}{52} = \frac{1}{13}$ (yes.)

$P(A|B) = P(A)$ too.

Some New Notation
(Conditional Probabilities)

This conditional probability notation is used to define what it means for two events to be **independent**:

Events A and B are **independent** if $P(B \mid A) = P(B)$

Example: Draw one card from a 52-card deck. Let A be the event that you drew a **face card**, and let B be the event that you drew a **queen**. Are A and B independent? NO

$P(B|A) = \frac{4}{12} = \frac{1}{3} \neq P(B) = \frac{4}{52} = \frac{1}{13}$

$P(A|B) = \frac{4}{4} = 1$ $\quad P(A) = \frac{12}{52} \neq 1$

Some New Notation
(Conditional Probabilities)

This conditional probability notation is used to define what it means for two events to be **independent**:

Events A and B are **independent** if P(B | A) = P(B)

Example: Suppose A and B are disjoint events, where P(A) = 1/5 and P(B) = 4/5. Are A and B independent events? NO.

$P(B|A) = 0$

$\neq P(B) = \frac{4}{5}$

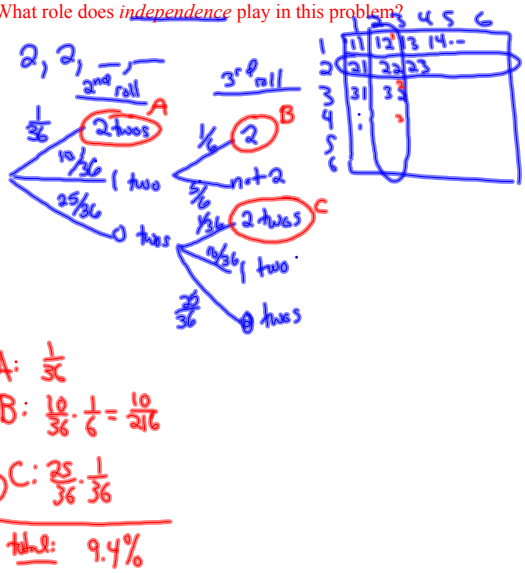
Four of a kind?

Example: In a game of chance similar to Yahtzee, you can roll four dice up to three times in an effort to make all four dice match. You can roll any or all of the dice on each turn.

Suppose you have rolled the dice on your first turn and they came up with a pair of 2's. What is the probability of making all four dice match in your next two turns?

Tip: Create a tree diagram

What role does *independence* play in this problem?



A: $\frac{1}{36}$

B: $\frac{10}{36} \cdot \frac{1}{6} = \frac{10}{216}$

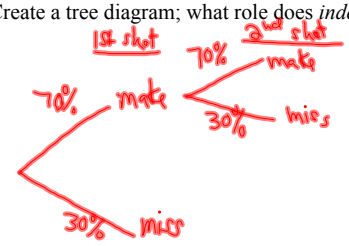
+ C: $\frac{25}{36} \cdot \frac{1}{36}$

Total: 9.4%

One-and-one: In basketball, "one-and-one" foul shooting is done as follows: if the player makes the first shot (1 point), she is given a second shot. If she misses the first shot, she is not given a second shot.

Susan has a 70% foul shot record (she makes 70% of her foul shots). Find the probability that, on a given one-and-one foul shooting opportunity, she scores (a) no points, (b) 1 point, (c) 2 points.

i) Create a tree diagram; what role does *independence* play here?



a) 30%

b) 21%

c) 49%

One-and-one: In basketball, "one-and-one" foul shooting is done as follows: if the player makes the first shot (1 point), she is given a second shot. If she misses the first shot, she is not given a second shot.

Susan has a 70% foul shot record (she makes 70% of her foul shots). Find the probability that, on a given one-and-one foul shooting opportunity, she scores (a) no points, (b) 1 point, (c) 2 points.

ii) Create an area model