Questions on Homework?

The biggest knight at King Arthur's round table was
Sir Cumference.
He acquired his size from eating too much pi.

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Warm-Up

Sam and John are flipping coins. The last 10 results have been HHHHHHHHHH. Sam bets John $5 that the next flip will come up tails. Who has a better chance of winning?

+	1	2	3	4	5	6
1		2	3	4	5	
2		3	4	5		
3		4	5			
4		5				
5						

What is the probability of getting a sum of 5 or less if you roll 2 dice? $\frac{10}{36} = \frac{5}{18}$

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2.4: TREE DIAGRAMS AND PROBABILITY MODELS

Learning Targets

- Understand how to build and properly notate a tree diagram
- Understand how to calculate probabilities using a tree diagram
- Understand how to verify if a tree diagram is correct
- Be able to build a probability model by using a tree diagram

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PROBABILITY MODEL -
A list or table of all possible outcomes matched up with their probabilities. The probabilities must add up to 1 and each probability must be a number between 0 and 1.

Ex. A die

outcomes	1	2	3	4	5	6
probability	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
	17%	17%	17%	17%	17%	17% = 102%

Ex. A bag of marbles with 7 red, 5 black, 12 blue, 3 green and 3 white.

outcomes	R	Bl	Blue	G	W
probability	$\frac{7}{30}$	$\frac{5}{30}$	$\frac{12}{30}$	$\frac{3}{30}$	$\frac{3}{30}$
	$\frac{1}{6}$	$\frac{2}{5}$	$\frac{1}{10}$	$\frac{1}{10}$	

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Here is a probability distribution of grades in Ms. Polchow's classes:

Grades	A	B	C	D	F
Probability	.15	.30	.30	.15	.10
	15%	30%	30%	15%	10%

Is this a valid probabillity model? How do you know?

What is the probability that a randomly chosen student in Ms. Polchow's class will get an A or a B? 45%
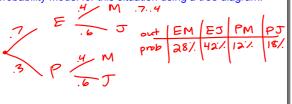
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Construct a probability model for a family of 3 children (gender) using a tree diagram. The probability model should show the number of boys possible.

# of boys	0	1	2	3
probab.	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$
	.125	.375	.375	.125

P(1 boy and 2 girls)?

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Example: At a restaurant, there are 2 breakfast platters that are served, one has eggs and the other has pancakes. There are also 2 choices for drinks: milk or juice. Thirty percent of customers choose the pancakes and 40% of customers choose milk. Assume the platter choices are independent of the drink choices. Build a probability model for this situation using a tree diagram.
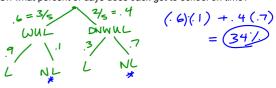

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Jack wakes up late on average 3 days of every 5.

If Jack wakes up late, the probability he is late for school is 9/10.

If Jack does not wake up late, the probability he is late for school is 3/10.

On what percent of days does Jack get to school on time?

$$(.6)(.1) + .4(.7) = 34\%$$

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Assignment:

Section 2.4   #1, 3, 4, 9, 11-14

→ tree diagram prob. model

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EXTRA CREDIT PROBLEM:

The probability of a fine day is $\frac{3}{7}$ and the probability of a wet day is $\frac{4}{7}$

If it's a fine day:
the probability Joe cycles to work is $\frac{7}{10}$
the probability Joe drives to work is $\frac{2}{10}$
and the probability Joe takes the train to work is $\frac{1}{10}$

If it's a wet day
the probability Joe cycles to work is $\frac{1}{9}$
the probability Joe drives to work is $\frac{5}{9}$
and the probability Joe takes the train to work is $\frac{3}{9}$

For a day selected at random, what is the probability Joe takes the train to work?

Construct a tree diagram. 5 points extra credit. Give the answer in fraction form.

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