Ch 3.4 Multiplication Method

How can you figure out the total number of outcomes?

- list all the possible ways randomly
- tree diagram
- counting rule

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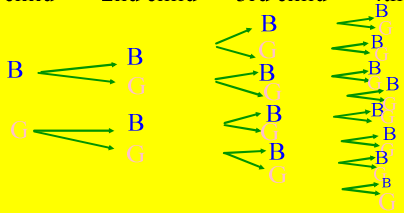
Ex 1) Tree Diagram

a) How many ways can you have 4 kids?

1st child 2nd child 3rd child 4th child



total # of outcomes=

P(2 boys and 2 girls and order doesn't matter)=

P(3 boys and 1 girl and order doesn't matter)=

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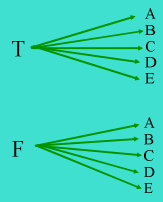
Ex1b) How many outcomes are there for 2 questions on an exam with 1st T/F and 2nd Multiple choice (ABCDE)?

1st Q 2nd Q



Total number of ways to answer the 2 questions?

P(get both correct)=

P (get 1st correct and 2nd wrong)=

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Try) How many different meal choices can be served if you offer the following:

meat: chicken or steak

sides: potatoes, fries, or hash browns

drinks: milk or tea

P(someone orders fries and milk)

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Tree diagram is time consuming, but shows all the different outcomes.

Option #2. Counting Rule- multiply all the different number of choices.

Ex2a) # of different ways to have 4 kids

1st child 2nd child 3rd child 4th child

2 x 2 x 2 x 2

16 differnet ways

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Ex2b) # ways to answer T/F and a multiple choice question with 5 choices.

Q1 Q2

2 x 5 = 10 different ways

Ex2c) 4 friends go to a restaurant how many different ways can they sit at a table?

Try#2: # of meals from last try problem

2 meats, 3 potato choices, and 2 drinks

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Ex3) Multiplication Rule = P(A and B) = P(A) x P(B)

a) P (1st correct and 2nd wrong on a T/F and Multiple choice (ABCDE))=

b) P(Choose tea and fries)

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Ex4) With and without Replacement

a) P(draw 2 cards with them being an ace and a face card w/o replacement)

b) P(draw 2 of a kind w/o replacement)

Bag contains 5 green, 2 red, and 3 yellow marbles. P(draw a green and a yellow with replacement)=

P(draw a red and yellow w/o replacement)=

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Try#3. 10 guys and 15 girls in the class. P(guy and a gal are chosen for 2 questions for bell work)

P(2 guys are chosen for 2 questions for bell work)

Try#4. From a deck of 52 cards find the following: P(draw an ace and a jack with replacement)

P(draw 2 face cards w/o replacement)

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Ex5) If a sample size is less than 5% of the population treat it as independent(even if made w/o replacement).

Company has a new process of making cameras. The company has a defective rate of 3%. If in a batch of 1000 cameras we choose to test 12, what is the probability all of them are not defective?

12/1000 = 1.2% of population * use with replacement

P(1st good x 2nd good x 3rd good x.....12 th good)

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Ex5b) A battery company has 12% defective rate. If you need 3 batteries for your game controller what is the p(all 3 products are acceptable).

c) P(all 3 are defective)

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Try#5 If a tire company has a defective rate of 6%, what is the p(get 4 bad tires)?

Try#6. P(all 4 bad tires)

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