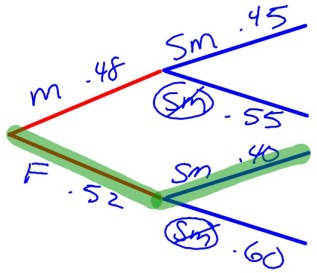
On a college campus 48% of the students are male. 45% of the males smoke. 60% of the females don't smoke.
Model this data with a tree diagram.




Then find these probabilities as a percent to the nearest tenth.

1. P(female and smoke) $(.52)\cdot(.40) = 20.8\%$
2. P(don't smoke | male) $= 55\%$
3. P(smoke)

$(.48)(.45) + (.52)(.40) = 42.4\%$

You can now finish Hwk #16

Sec 12-2

due tomorrow

Pages 656

Problems 1-8, 11, 12, 25-27

additional compared to the original plan

Simulation:
Examination of a problem often not subject to direct experimentation by means of a simulating device

You are going to take a 5 question True or False Quiz but you didn't study.

What do you think the probability is you will pass if you guess at all 5 questions?

How many questions do you have to get correct in order to pass?

Simulating guessing at all five T/F questions:

What could you use to simulate guessing at a True/False question? Flip a coin or roll a die

We'll define an EVEN # as guessing correctly.

- Working in pairs. Your pair will do 30 trials.
- Each trial will consist of rolling 5 dice to simulate guessing at the 5 questions.

| Trial # | # EVENS |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| • | |
| • | |
| • | |
| 30 | |

- For each trial record # of dice that come up EVEN
- When done with all 30 trials find the total # of times you got 3, 4, or 5 EVENS i.e. "passing".

| # times got 3, 4, or 5 EVENS: | # of trials |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Class totals = | |

Experimental P(pass) =

| | 1st hr | 2nd hr | 3rd hr | 5th hr | Total |
|---|---|---|---|---|---|
| # times pass | 129 | | 151 | | |
| # trials | 240 | | 300 | | |

Experimental probability of passing = $\frac{280}{540} = 51.8\%$

Theoretical Probability that pass:

Probability that guess correctly on a T/F question = 0.5

Prob Guess 3 correct = (0.5)(0.5)(0.5)(0.5)(0.5) = 3.125%
(correct, correct, correct, incorrect, incorrect)

How many ways can you get 3 out of 5 questions correct?

Order isn't important: ${}_5C_3 = 10$

$3.125\% \cdot 10 =$ 31.25%

Prob Guess 4 correct = (0.5)(0.5)(0.5)(0.5)(0.5) = 3.125%
(correct, correct, correct, correct, incorrect)

How many ways can you get 4 out of 5 questions correct?

Order isn't important: ${}_5C_4 = 5$

$3.125\% \cdot 5 =$ 15.625%

Prob Guess 5 correct = (0.5)(0.5)(0.5)(0.5)(0.5) = 3.125%
(correct, correct, correct, correct, correct)

How many ways can you get 5 out of 5 questions correct?

Order isn't important: ${}_5C_5 = 1$

$3.125\% \cdot 1 =$ 3.125%

Probability that you guess at all 5 questions on a T/F quiz and pass are:

3 correct OR 4 correct OR 5 correct =

3 correct = 31.25%
\+ 4 correct = 15.625%
\+ 5 correct = 3.125%

50% chance → this is the Theoretical Probability.