

Lesson 11 : continued : Calculating Theoretical Probability
 $0\% < P < 100\%$
 $0 < P < 1$

TP of a given event W :
Probability

$$P(W) = \frac{\text{\# of favourable outcomes in } W}{\text{\# of possible outcomes in } \Omega}$$

impossible \rightarrow
 $P = 0.2$
 $P = 0.5$ certain \uparrow
 probable \uparrow

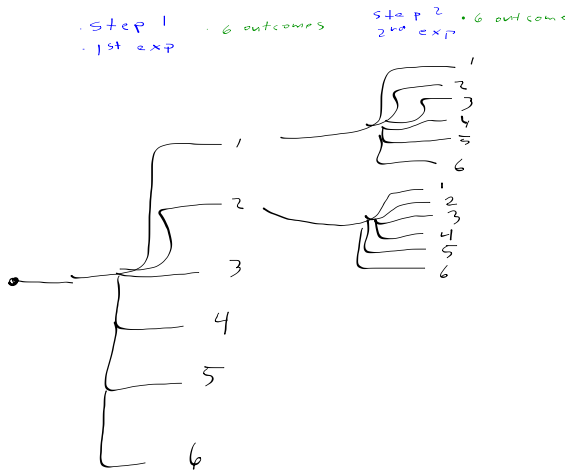
*before using a tree diagram helps!

(universe)
 (sample space)
 (whole thing)
 (2-step R.E)

Part
Whole

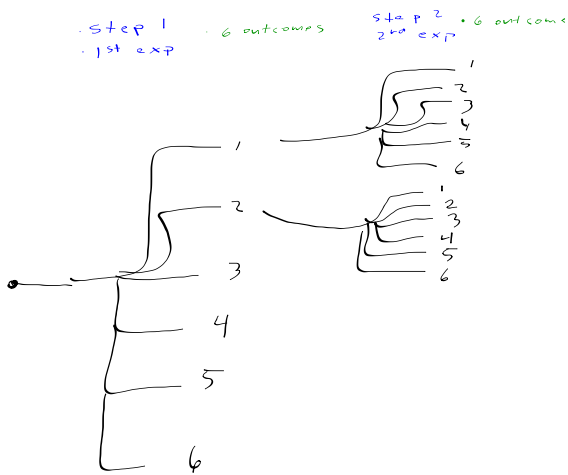
Random Experiment :

- roll 2 dice and take sum.
- (street dice/casino craps)



Outcomes:	Sum	1st roll: come out roll
(1, 1)	2	
(1, 2)	3	
(1, 3)	4	
(1, 4)	5	
(1, 5)	6	Event A: you win: roll a 7 or a 11.
(1, 6)	7	
(2, 1)	3	
(2, 2)	4	
(2, 3)	5	
(2, 4)	6	
(2, 5)	7	
(2, 6)	8	Event B: you lose: roll a 2, a 3, or a 12
(3, 1)	4	

$P(A) = \frac{8}{36} = 22\%$
 $P(B) = \frac{4}{36} = 11\%$
 Event C: keep rolling: any other #. that's your point
 $P(C) = \frac{24}{36} = 67\%$



- Outcomes:
- (1, 1)
 - (1, 2)
 - (1, 3)
 - (1, 4)
 - (1, 5)
 - (1, 6)
 - (2, 1)
 - (2, 2)
 - (2, 3)
 - (2, 4)
 - (2, 5)
 - (2, 6)
 - (3, 1)

2nd roll

Event A

- you win
- roll your point

ex 6
 $P(A) = \frac{5}{36} = 14\%$

Event B

- you lose
- roll a 7

$P(B) = \frac{6}{36} = 17\%$

Event C

- keep rolling

$100\% - 14\% - 17\% = 69\%$

You do:

Pg 203

7.10

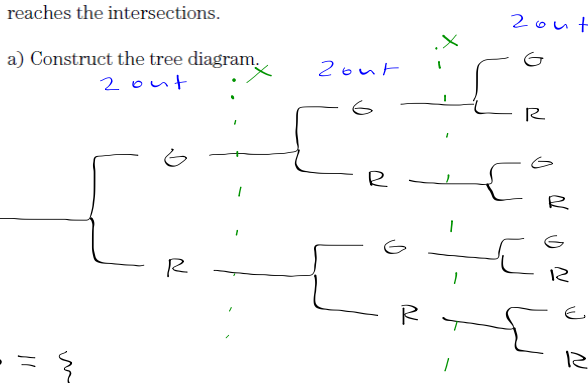
R.E.: drawing to 3 lights

- a) tree
- b) calculate prob
use formula!
- c) " " "

HMWK:
P202 - 204 # 7.7 - 7.11
(wouldn't hurt to draw a tree for an incomplete tree)

nota bene: on 2nd roll, you're always more likely to lose.
(the casino)
"The house always wins"

7.10 To get home, Mr. Larue has to cross three intersections with traffic lights. Answer the following questions assuming there is an equal chance that the traffic lights will turn red or green the moment Mr. Larue reaches the intersections.



- S (outcomes)
- (G, G, G) ✓
 - (G, G, R) ✓
 - (G, R, G) ✓
 - (G, R, R)
 - (R, G, G) ✓
 - (R, G, R)
 - (R, R, G)
 - (R, R, R)

S = {

b) What is the probability that all three lights will be red?
only 1 outcome that favourable / satisfies

$$P(B) = \frac{\# \text{ of fav}}{\text{total \#}}$$

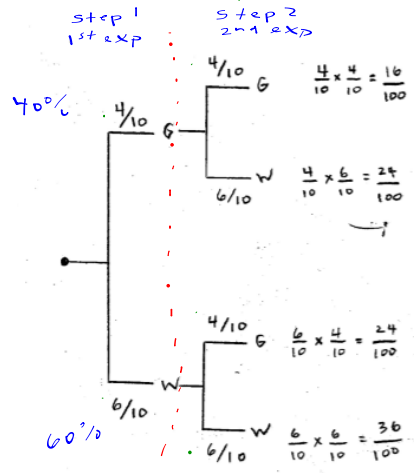
$$P(B) = \frac{1}{8}$$

c) What is the probability that at least two of these lights will be green?

$$P(C) = \frac{4}{8} = \frac{1}{2} = 50\%$$

Lesson 12: Constructing Probability Tree Diagrams
 (useful for non-equiprobable events) P T D

Random Experiment
 drawing 2 marbles
 from a bag w
 4 green marbles
 and 6 white marbles.
 (w replacement)
 2 step.
 ∴ independent events.



nota bene: when you go horizontally along the tree, you times (x) the probabilities.

note: in tree, keep probabilities as fractions. All prob. in one step should add up to 1 (ex $\frac{10}{10} = 1$)

you do: / homework:

P 250 # 9.4 - 9.5 (show me just (a), prob tree first)

P 213 # 7.23 - 7.24

R 215 - 216 # 7.27 - 7.36

} definition questions. good to revisit