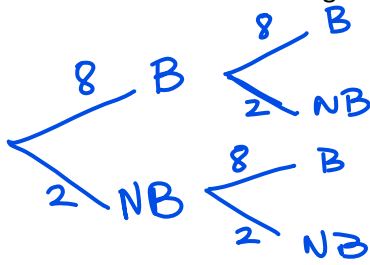


29. The probability that Samuel, a keen member of the school Archery Club, hits the bullseye is 0.8. Samuel takes two shots. Assume that success with each shot is independent from the previous shot. Represent this information on a tree diagram. Then, find the probability that Samuel



a. Hits two bullseye

$$(0.8)(0.8) = 0.64$$

b. Hits only one bullseye

$$(0.8)(0.2) + (0.2)(0.8) = 0.16 + 0.16 = 0.32$$

c. Hits at least one bullseye

$$(0.8)(0.8) + (0.8)(0.2) + (0.2)(0.8) = 0.96 \quad / \quad 1 - P(NB) = 1 - (0.2)(0.2) = 1 - 0.04 = 0.96$$

30. There are an equal number of boys and girls in a school and it is known that  $\frac{1}{10}$  of the boys and  $\frac{1}{10}$  of the girls walk to school every day. Also  $\frac{1}{3}$  of the boys and  $\frac{1}{2}$  of the girls drive their own car. The rest come by bus.

Determine

if 60 students

	WALK	DRIVE	BUS	Total
Boys	3	10	17	30
Girls	3	15	12	30
Total	6	25	29	60

a. The proportion of the school population that are girls who come by bus.

$$\frac{12}{60}$$

b. The proportion of the school population that come by bus

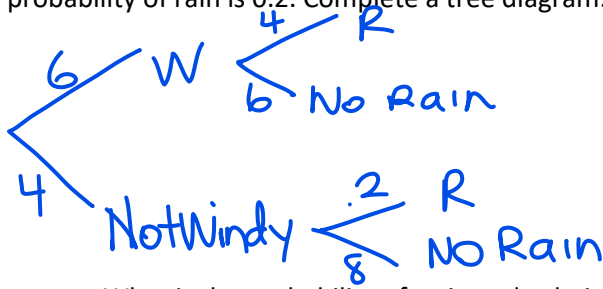
$$\frac{29}{60}$$

31. Determine the probability of getting two heads in three tosses of a biased coin for which  $P(\text{head}) = \frac{2}{3}$

$$HTH + HHT + THH$$

$$\left(\frac{2}{3}\right)\left(\frac{1}{3}\right)\left(\frac{2}{3}\right) + \left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{1}{3}\right) + \left(\frac{1}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \frac{4}{27}(3) = \frac{4}{9}$$

32. The probability of a day being windy is 0.6. If it's windy the probability of rain is 0.4. If it's not windy the probability of rain is 0.2. Complete a tree diagram.



a. What is the probability of a given day being rainy?

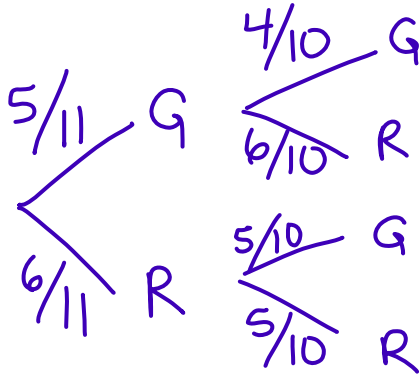
$$(6)(.4) + (4)(.2) = 24 + 08 = 32$$

b. What is the probability of two successive days NOT being rainy?

$$P(\text{1 day w/ no rain}) = (6)(6) + (4)(8) = 36 + 32 = 68 \quad \Bigg/ \quad \frac{P(\text{no rain 2 days})}{= (.68)(.68)}$$

33. A bag contains 5 green and 6 red balls. If two balls are taken out successively, without replacement, what is the probability that

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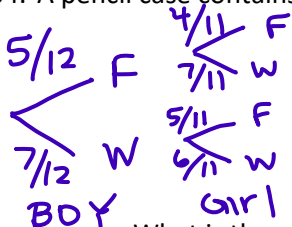
a. At least one green is chosen

$$1 - (\text{No green (all red)}) = 1 - \frac{6}{11} \cdot \frac{5}{10} = \frac{80}{110} = \frac{8}{11}$$

b. Red is picked on the first pick given that at least one green is chosen

$$P(\text{Red 1st} \mid \text{At least 1 Green}) = \frac{P(\text{R 1st} \cap \text{At least 1 green})}{P(\text{At least 1 green})} = \frac{\frac{6}{11} \cdot \frac{5}{10}}{\frac{8}{11}} = \frac{3}{8}$$

34. A pencil case contains 5 faulty and 7 working pens. A boy and then a girl each need to take a pen.



a. What is the probability that two faulty pens are chosen?

$$\frac{5}{12} \cdot \frac{4}{11} = \frac{20}{132} = \frac{5}{33}$$

b. What is the probability that at least one faulty pen is chosen?

$$1 - (\text{No faulty (both work)}) = 1 - \frac{7}{12} \cdot \frac{6}{11} = \frac{90}{132} = \frac{15}{22}$$

c. If exactly one faulty pen is chosen, what is the probability that the girl chose it?

$$P(\text{Girl chose faulty} \mid \text{Exactly 1 faulty}) = \frac{P(\text{girl chose F} \cap \text{Exactly 1 faulty})}{P(\text{Exactly 1 faulty})} = \frac{\frac{7}{12} \cdot \frac{5}{11}}{\frac{5}{12} \cdot \frac{7}{11} + \frac{7}{12} \cdot \frac{5}{11}} = \frac{35}{70} = \frac{1}{2}$$