

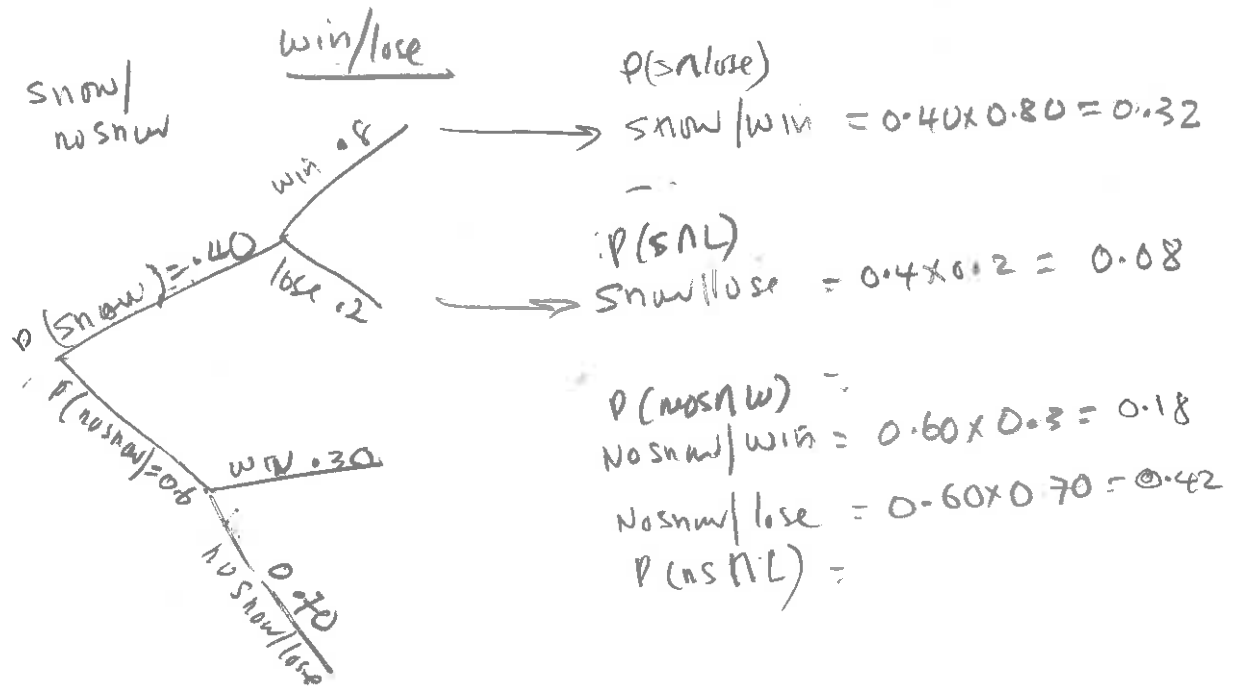
$$P(A \cap B) = P(A) \times P\left(\frac{B}{A}\right)$$

If you are not given a sample space, a tree diagram can help calculate conditional probability:

Example 4

The probability of snow during a football game is 0.40. If it snows, the probability the Bombers win a game is 0.80. If it doesn't snow, the probability the Bombers win is 0.30.

a) Draw a tree diagram and fill in all probabilities.



- b) Calculate the probability of the Bombers winning the game.
- $$P(\text{win}) = P(\text{snow/win}) + P(\text{no snow/win})$$
- $$= 0.32 + 0.18$$

$$P(\text{win}) = 50\% = 0.50$$

- c) ***NEW*** Calculate the probability that it snowed, **given that** the Bombers lost.

$$P(\text{snow/lose}) = \frac{P(\text{snow/lose})}{P(\text{no snow/lose}) + P(\text{snow/lose})}$$

$$= \frac{0.08}{0.42 + 0.08}$$

$$= 0.16$$

$$\text{or } 16\%$$