

Name: Key
Date: _____

Mr. Johnson
Math 8

Lesson 7.4 – Solving Problems Involving Independent Events

Think it out:

A coin is tossed and two dice are rolled.

What is the probability of getting a Heads, 1, and 1.

$$\left. \begin{array}{l} P(H) = \frac{1}{2} \\ P(1) = \frac{1}{6} \\ P(1) = \frac{1}{6} \end{array} \right\} = P(H) \times P(1) \times P(1) \\ = \frac{1}{2} \times \frac{1}{6} \times \frac{1}{6} \\ = \frac{1}{72}$$

or use a tree diagram

Notes:

Remember from last lesson that $P(A \& B) = \underline{P(A) \times P(B)}$. This rule can be extended for the the Probability of n events, where n is the number of events.

For example: If A, B, and C are independent events, then

$$P(A \& B \& C) = P(A) \times P(B) \times P(C)$$

Examples:

1. The probability of rain tomorrow in Kelowna is 20%, 35% in Vancouver, and 50% in Victoria. What is the probability that it will rain in all three cities?

$$\begin{array}{l} P(\text{Rain K}) = 20\% = 0.2 \\ P(\text{Rain Van}) = 35\% = 0.35 \\ P(\text{Rain Vic}) = 50\% = 0.50 \end{array}$$

$$\therefore P(\text{Rain K and Van and Vic}) = (0.2) \times (0.35) \times (0.50) \\ = 0.035 \text{ or } \frac{7}{200}$$

2. Suppose the probability of you buying a pop and winning something under the cap is $\frac{1}{8}$. What is the probability if you buy three drinks that you will win a prize on all 3 of them?

$$P(\text{win and win and win}) = \left(\frac{1}{8}\right) \times \left(\frac{1}{8}\right) \times \left(\frac{1}{8}\right) \\ = \frac{1}{512}$$

Assignment:
Pg. 420-422
#’s 1, 4-9, 13, 15-16

