Independent and Dependent Events

Mr. Wong

6th Grade Mathematics

Independent Events

Are events in which prior events do not affect the current event.

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

Dependent Events

Are events in which prior events affect the current event.

$$P(A \text{ and } B) = P(A) \cdot P(B \text{ after } A)$$

$$P(A \text{ and } B) = P(A) \bullet P(B)$$

Independent Events

You roll a number cube once. Then you roll it again. What is the probability that you get a 3 on the first roll and a number less than 5 on the second roll?

$$P(3) = 1/6 \qquad P(< 5) = 4/6 = 2/3$$

$$P(3) \bullet P(< 5) = 1/6 \bullet 2/3$$

$$P(3) \bullet P(< 5) = 2/18 = 1/9$$

$P(A \text{ and } B) = P(A) \cdot P(B)$

Independent Events

You roll a number cube once. Then you roll it again. What is the probability that you get a even on the first roll and a number more than 4 on the second roll?

$P(\text{Even}) = 3/6 = 1/2$ $P(> 4) = 2/6 = 1/3$

$P(\text{Even}) \cdot P(> 4) = 1/2 \cdot 1/3$

$P(\text{Even}) \cdot P(> 4) = 1/6$

$P(A \text{ and } B) = P(A) \cdot P(B \text{ after } A)$

Dependent Events

Three girls and four boys volunteer to represent their class at a school assembly. The teacher selects one name and then another from a bag containing seven names. What is the probability that both representatives are girls?

$P(G) = 3/7$ $P(G \text{ after } G) = 2/6 = 1/3$

$P(G) \cdot P(G \text{ after } G) = 3/7 \cdot 1/3$

$P(G) \cdot P(G \text{ after } G) = 3/21 = 1/7$

$$P(A \text{ and } B) = P(A) \cdot P(B \text{ after } A)$$

$$P(E) = \frac{\text{# of favorable}}{\text{# of possible}}$$

Dependent Events

Three girls and four boys volunteer to represent their class at a school assembly. The teacher selects one name and then another from a bag containing seven names. What is the probability that the first one is a boy and the second is a girl?

$$P(B) = 4/7 \quad P(G \text{ after } B) = 3/6 = 1/2$$

$$P(B) \cdot P(G \text{ after } B) = 4/7 \cdot 1/2$$

$$P(B) \cdot P(G \text{ after } B) = 4/14 = 2/7$$