

11.4 Dependents Events Day 2

Lesson Objectives

- Understand dependent events.
- Use the rules of probability to solve problems with dependent events.

Example 11 Solve probability problems involving dependent events with more than one favorable outcome.

Scott randomly chooses to go to school by either bus or bicycle, but not both. The tree diagram below shows that Scott's choice of transportation depends on the weather. The probability that it rains on a particular day is denoted by a . Assume that rainy and sunny days are mutually exclusive events.

- a) If the probability that it rains is $\frac{1}{2}$, find the probability that Scott will take a bus to school on any day.

You need to find the probability that Scott takes the bus on a rainy day plus the probability that he takes the bus on a sunny day.

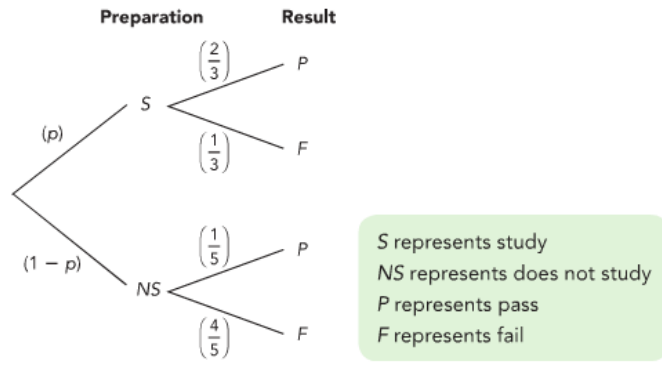


- b) If the probability that it rains is $\frac{5}{8}$, find the probability that Scott will ride a bicycle to school.

Guided Practice

Solve. Show your work.

- 3 The tree diagram below shows how passing a test depends on whether a student studies (S) or does not study (NS) for the test. The probability that a student studies is denoted by p . Assume that S and NS are mutually exclusive events.



- a) If the probability of studying is 0.4, find the probability that a student passes the test.

$$P(S) = \frac{?}{?}$$

Write the fraction for 0.4.

$$P(NS) = 1 - P(S)$$

Events S and NS are complementary.

$$= 1 - \frac{?}{?}$$

$$= \frac{?}{?}$$

$$P(P) = \frac{?}{?} \cdot \frac{?}{?} + \frac{?}{?} \cdot \frac{?}{?}$$

Evaluate $P(S, P) + P(NS, P)$.

$$= \frac{?}{?}$$

If the probability of studying is 0.4, then the probability that a student passes the test is .

- b) If the probability of studying is 0.75, find the probability that a student fails the test.

$$P(S) = \frac{?}{?}$$

Write the fraction for 0.75.

$$P(NS) = 1 - P(S)$$

Events S and NS are complementary.

$$= 1 - \frac{?}{?}$$

$$= \frac{?}{?}$$

$$P(F) = \frac{?}{?} \cdot \frac{?}{?} + \frac{?}{?} \cdot \frac{?}{?}$$

Evaluate $P(S, F) + P(NS, F)$.

$$= \frac{?}{?}$$

If the probability of studying is 0.75, then the probability that a student fails the test is .