

Independent and Dependent Events

1. Determine which of the following are examples of independent or dependent events.
 - a. Rolling a 5 on one die and rolling a 5 on a second die. **independent**
 - b. Choosing a cookie from the cookie jar and choosing a jack from a deck of cards. **Indepen.**
 - c. Selecting a book from the library and selecting a book that is a mystery novel. **Dependent**
 - d. Going to the beach and bringing an umbrella. **Dependent**
 - e. Getting gasoline for your car and getting diesel fuel for your car. **dependent**
 - f. Choosing an 8 from a deck of cards, replacing it, and choosing a face card. **Indepen.**
 - g. Choosing a jack from a deck of cards and choosing another jack, without replacement. **dependent**
 - h. Being lunchtime and eating a sandwich. **dependent**
2. A coin and a die are tossed. Calculate the probability of getting tails and a 5. **1/12**
3. In Tania's homeroom class, 9% of the students were born in March and 40% of the students have a blood type of O+. What is the probability of a student chosen at random from Tania's homeroom class being born in March and having a blood type of O+? **.036 or 3.6%**
4. If a baseball player gets a hit in 31% of his at-bats, what is the probability that the baseball player will get a hit in 5 at-bats in a row? **.0029 or .29%**
5. What is the probability of tossing 2 coins one after the other and getting 1 head and 1 tail? **1/4**
6. 2 cards are chosen from a deck of cards. The first card is replaced before choosing the second card. What is the probability that they both will be clubs? **1/16**
7. 2 cards are chosen from a deck of cards. The first card is replaced before choosing the second card. What is the probability that they both will be face cards? **9/169**

8. If the probability of receiving at least 1 piece of mail on any particular day is 22%, what is the probability of *not* receiving any mail for 3 days in a row? $P(\text{not receiving mail}) = 1 - .22 = .78$. $P(\text{no mail for 3 days}) = (.78)(.78)(.78) = .475$ or 47.5%
9. Johnathan is rolling 2 dice and needs to roll an 11 to win the game he is playing. What is the probability that Johnathan wins the game? $2/6 \times 1/6 = 1/18$
10. Thomas bought a bag of jelly beans that contained 10 red jelly beans, 15 blue jelly beans, and 12 green jelly beans. What is the probability of Thomas reaching into the bag and pulling out a blue or green jelly bean and then reaching in again and pulling out a red jelly bean? Assume that the first jelly bean is not replaced. $27/37 \times 10/36 = 15/74$
11. For question 10, what if the order was reversed? In other words, what is the probability of Thomas reaching into the bag and pulling out a red jelly bean and then reaching in again and pulling out a blue or green jelly bean *without replacement*? $10/37 \times 27/36 = 15/74$; **same**
12. What is the probability of drawing 2 face cards one after the other from a standard deck of cards *without replacement*? $12/52 \times 11/51 = 11/221$
13. There are 3 quarters, 7 dimes, 13 nickels, and 27 pennies in Jonah's piggy bank. If Jonah chooses 2 of the coins at random one after the other, what is the probability that the first coin chosen is a nickel and the second coin chosen is a quarter? Assume that the first coin is not replaced. $13/50 \times 3/49 = 39/2450$ or .016
14. For question 13, what is the probability that neither of the 2 coins that Jonah chooses are dimes? Assume that the first coin is not replaced. $43/50 \times 42/49 = 129/175$
15. Jenny bought a half-dozen doughnuts, and she plans to randomly select 1 doughnut each morning and eat it for breakfast until all the doughnuts are gone. If there are 3 glazed, 1 jelly, and 2 plain doughnuts, what is the probability that the last doughnut Jenny eats is a jelly doughnut? $5/6 \times 4/5 \times 3/4 \times 2/3 \times 1/2 \times 1 = 1/6$
16. Steve will draw 2 cards one after the other from a standard deck of cards *without replacement*. What is the probability that his 2 cards will consist of a heart and a diamond? $13/52 \times 13/51 = 13/204$