

Dependent, Independent and Complementary Events

Determine whether the scenario involves independent or dependent events. Then find the probability.

- 1) A bag contains five red marbles and four blue marbles. You randomly pick a marble and then pick a second marble without returning the marbles to the bag. Both marbles are red.
- 2) There are four nickels and five dimes in your pocket. You randomly pick a coin out of your pocket and place it on a counter. Then you randomly pick another coin. Both coins are nickels.
- 3) You flip a coin twice. The first flip lands tails-up and the second flip lands heads-up.
- 4) You roll a fair six-sided die twice. The first roll shows a six and the second roll shows a two.
- 5) A bag contains five red marbles and eight blue marbles. Another bag contains six green marbles and seven yellow marbles. You randomly pick one marble from each bag. One marble is blue and one marble is yellow.
- 6) You flip a coin and then roll a fair six-sided die. The coin lands heads-up and the die shows an even number.
- 7) A cooler contains fifteen bottles of sports drink: seven lemon-lime flavored and eight orange flavored. You randomly grab a bottle and give it to your friend. Then, you randomly grab a bottle for yourself. Your friend gets a lemon-lime and you get an orange.
- 8) You flip a coin twice. The first flip lands heads-up and the second flip lands tails-up.
- 9) There are eight boys and six girls in a class. The teacher randomly selects one student to answer a question. Later, the teacher randomly selects a different student to answer another question. The first student is a boy and the second student is a girl.
- 10) A cooler contains twelve bottles of sports drink: five lemon-lime flavored, four orange flavored, and three fruit-punch flavored. You randomly grab a bottle. Then you return the bottle to the cooler, mix up the bottles, and randomly select another bottle. The first time, you get a lemon-lime drink. The second time, you get a fruit-punch.

- 11) A bag contains four red marbles and six blue marbles. You randomly pick a marble and then pick a second marble without returning the marbles to the bag. Both marbles are red.
- 12) Your sock drawer has six white socks, two brown socks, and four black socks. You randomly pick a sock and put it on your left foot and then pick another sock and put it on your right foot. You leave the house with a white sock on your left foot and a brown sock on your right foot.
- 13) A basket contains eight apples and seven peaches. You randomly select one piece of fruit and eat it. Then you randomly select another piece of fruit. Both pieces of fruit are apples.
- 14) Your sock drawer has four white socks, four brown socks, and six black socks. You randomly pick two socks and get a matching pair of black socks.
- 15) A box of chocolates contains six milk chocolates and eight dark chocolates. You randomly pick a chocolate and eat it. Then you randomly pick another piece. The first piece is milk chocolate and the second piece is dark chocolate.
- 16) A bag contains seven red marbles and seven blue marbles. You randomly pick a marble and then return it to the bag before picking another marble. Both the first and second marbles are red.
- 17) A cooler contains eleven bottles of sports drink: three lemon-lime flavored, five orange flavored, and three fruit-punch flavored. You randomly grab a bottle. Then you return the bottle to the cooler, mix up the bottles, and randomly select another bottle. The first time, you get a lemon-lime drink. The second time, you get a fruit-punch.
- 18) You flip a coin twice. The first flip lands tails-up and the second flip lands heads-up.
- 19) A basket contains eight apples and four peaches. You randomly select a piece of fruit and then return it to the basket. Then you randomly select another piece of fruit. Both pieces of fruit are apples.
- 20) Your sock drawer has four white socks, six brown socks, and four black socks. You randomly pick two socks and get a matching pair of black socks.

21) There are eight nickels and six dimes in your pocket. Three times, you randomly pick a coin out of your pocket, return it to your pocket, and then mix-up the change in your pocket. The first time, the coin is a nickel. The second time, it's a dime. The third time, it's a nickel.

22) A box of chocolates contains three milk chocolates, four dark chocolates, and three white chocolates. You randomly select and eat three chocolates. The first piece is milk chocolate, the second is dark chocolate, and the third is white chocolate.

23) There are eleven shirts in your closet, three blue, five green, and three red. You randomly select a different shirt each day. You wear a blue shirt on Monday, Tuesday, and Wednesday.

24) A basket contains five apples and four peaches. Three times, you randomly select a piece of fruit, return it to the basket, and then mix the fruit. All three times, the fruit is an apple.

25) There are three nickels, three dimes, and five quarters in your pocket. You randomly pick three coins and place them on a counter. The first two coins are a dimes, and the third is a quarter.

Events A and B are independent. Find the missing probability.

26) $P(A) = \frac{3}{10}$ $P(\text{not } B) = \frac{13}{20}$ $P(A \text{ and } B) = ?$

27) $P(A) = \frac{7}{20}$ $P(B) = \frac{1}{2}$ $P(A \text{ and } B) = ?$

28) $P(B) = \frac{13}{20}$ $P(A \text{ and } B) = \frac{117}{400}$ $P(A) = ?$

29) $P(A) = \frac{13}{20}$ $P(A \text{ and } B) = \frac{13}{50}$ $P(\text{not } B) = ?$

30) $P(B) = \frac{2}{5}$ $P(A \text{ and } B) = \frac{9}{50}$ $P(A) = ?$

31) $P(A) = \frac{9}{20}$ $P(B) = \frac{3}{4}$ $P(A \text{ and } B) = ?$

32) $P(\text{not } A) = \frac{3}{5}$ $P(A \text{ and } B) = \frac{1}{10}$ $P(B) = ?$

33) $P(A) = \frac{9}{20}$ $P(A \text{ and } B) = \frac{27}{200}$ $P(B) = ?$

34) $P(A) = \frac{1}{4}$ $P(B) = \frac{1}{5}$ $P(A \text{ and } B) = ?$

35) $P(\text{not } B) = \frac{3}{10}$ $P(A \text{ and } B) = \frac{77}{200}$ $P(A) = ?$

Answers to Dependent, Independent and Complementary Events

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|-----------------------------------------------|------------------------------------------------|--------------------------------------------------|---------------------|
| 1) Dependent; $\frac{5}{18} \approx 0.278$ | 2) Dependent; $\frac{1}{6} \approx 0.167$ | 3) Independent; $\frac{1}{4} = 0.25$ | |
| 4) Independent; $\frac{1}{36} \approx 0.028$ | 5) Independent; $\frac{56}{169} \approx 0.331$ | 6) Independent; $\frac{1}{4} = 0.25$ | |
| 7) Dependent; $\frac{4}{15} \approx 0.267$ | 8) Independent; $\frac{1}{4} = 0.25$ | 9) Dependent; $\frac{24}{91} \approx 0.264$ | |
| 10) Independent; $\frac{5}{48} \approx 0.104$ | 11) Dependent; $\frac{2}{15} \approx 0.133$ | 12) Dependent; $\frac{1}{11} \approx 0.091$ | |
| 13) Dependent; $\frac{4}{15} \approx 0.267$ | 14) Dependent; $\frac{15}{91} \approx 0.165$ | 15) Dependent; $\frac{24}{91} \approx 0.264$ | |
| 16) Independent; $\frac{1}{4} = 0.25$ | 17) Independent; $\frac{9}{121} \approx 0.074$ | 18) Independent; $\frac{1}{4} = 0.25$ | |
| 19) Independent; $\frac{4}{9} \approx 0.444$ | 20) Dependent; $\frac{6}{91} \approx 0.066$ | 21) Independent; $\frac{48}{343} \approx 0.14$ | |
| 22) Dependent; $\frac{1}{20} = 0.05$ | 23) Dependent; $\frac{1}{165} \approx 0.006$ | 24) Independent; $\frac{125}{729} \approx 0.171$ | |
| 25) Dependent; $\frac{1}{33} \approx 0.03$ | 26) $\frac{21}{200}$ | 27) $\frac{7}{40}$ | |
| 28) $\frac{9}{20}$ | 29) $\frac{3}{5}$ | 30) $\frac{9}{20}$ | 31) $\frac{27}{80}$ |
| 32) $\frac{1}{4}$ | 33) $\frac{3}{10}$ | 34) $\frac{1}{20}$ | 35) $\frac{11}{20}$ |