

Adding Probabilities Worksheet

I. Lisa has 9 rings in her jewelry box. Five are gold and 4 are silver. If she randomly selects 3 rings to wear to a party, find each probability.

1. $P(2 \text{ silver or } 2 \text{ gold}) = \frac{5}{6}$

2. $P(\text{all gold or all silver}) = \frac{1}{4}$

3. $P(\text{at least } 2 \text{ gold}) = \frac{25}{42}$

4. $P(\text{at least } 1 \text{ silver}) = \frac{37}{42}$

II. Seven girls and six boys walk into a video store at the same time. There are five salespeople available to help them. Find the probability that the salespeople will first help the given numbers of girls and boys.

5. $P(4 \text{ girls or } 4 \text{ boys}) = \frac{{}^7C_4 {}^6C_1 + {}^6C_4 {}^7C_1}{{}^{13}C_5} = \frac{315}{1287} = \frac{35}{143}$

6. $P(3 \text{ girls or } 3 \text{ boys}) = \frac{{}^7C_3 {}^6C_2 + {}^6C_3 {}^7C_2}{{}^{13}C_5} = \frac{945}{1287} = \frac{105}{143}$

7. $P(\text{all girls or all boys}) = \frac{{}^7C_5 + {}^6C_5}{{}^{13}C_5} = \frac{27}{1287} = \frac{3}{143}$

8. $P(\text{at least } 3 \text{ girls}) = \frac{{}^7C_3 {}^6C_2 + {}^7C_4 {}^6C_1 + {}^7C_5}{{}^{13}C_5} = \frac{756}{1287} = \frac{84}{143}$

9. $P(\text{at least } 4 \text{ girls or at least } 4 \text{ boys}) = \frac{{}^7C_4 {}^6C_1 + {}^7C_5 + {}^6C_4 {}^7C_1}{{}^{13}C_5} = \frac{342}{1287} = \frac{38}{143}$

10. $P(\text{at least } 2 \text{ boys}) = 1 - \left(\frac{{}^7C_5 + {}^7C_4 {}^6C_1}{{}^{13}C_5} \right) = \frac{1056}{1287} = \frac{32}{39}$

III. Determine whether the events are mutually exclusive or inclusive. Then find the probability.

11. There are 3 literature books, 4 Algebra books, and 2 biology books on a shelf. If a book is randomly selected, what is the probability of selecting a literature book or an Algebra book?

$\frac{7}{9}$

exclusive

12. A die is rolled. What is the probability of rolling a 5 or a number greater than 3?

$\frac{1}{2}$

inclusive

13. In the Math Club, 7 of the 20 girls are seniors, and 4 of 14 boys are seniors. What is the probability of randomly selecting a boy or a senior to represent the Math Club at a statewide math contest?

$\frac{21}{34}$

inclusive

14. A card is drawn from a standard deck of cards. What is the probability of drawing an ace or a face card?

$\frac{16}{52} = \frac{4}{13}$

exclusive

15. One tile with each letter of the alphabet is placed in a bag, and one is drawn at random. What is the probability of selecting a vowel or a letter from the word equation?

$\frac{8}{26} = \frac{4}{13}$

inclusive

16. Each of the numbers from 1 to 30 is written on a card and placed in a bag. If one card is drawn at random, what is the probability that the number is a multiple of 2 or a multiple of 3?

$\frac{20}{30} = \frac{2}{3}$

inclusive

17. Two cards are drawn from a standard deck of cards. Find each probability.

a. $P(\text{both kings or both black}) = \frac{{}^6C_2 + {}^{32}C_2 - {}^6C_2}{{}^{52}C_2} = \frac{330}{1326}$

b. $P(\text{both kings or both face cards}) = \frac{{}^6C_2 + {}^{16}C_2 - {}^6C_2}{{}^{52}C_2} = \frac{66}{1326}$

c. $P(\text{both face cards or both red}) = \frac{{}^{12}C_2 + {}^{26}C_2 - {}^6C_2}{{}^{52}C_2} = \frac{376}{1326}$

d. $P(\text{both either red or a king}) = \frac{{}^{28}C_2}{{}^{52}C_2} = \frac{378}{1326} = \frac{63}{221}$