Advanced Algebra Probability Review Worksheet

Name Answer Key
Period

Show all work for credit. Simplify all answers.

A bag contains 20 red, 35 white, 50 blue and 25 pink marbles. You pick one marble from the bag at random. Find each theoretical probability.

130 total marbles

1. P(white) $\frac{35 \div 5}{130 \div 5}$ — 1. 7/26

2. P(red or pink) $\frac{45 \div 5}{130 \div 5}$ — 2. 9/26

3. P(not blue) $\frac{80 \div 10}{130 \div 10}$ — 3. 8/13

4. P(purple) $\frac{0}{130}$ — 4. 0/130

5. You are going to set up a stereo system by buying separate components. You find 5 receivers, 8 different CD players and 12 different speaker systems. If you buy one of each of these components, how many different stereo systems are possible?

$5 \cdot 8 \cdot 12 = 480$ — 5. 480

6. ${}_{10}P_3$ — 6. 720

7. ${}_8C_5$ — 7. 56

8. Eight skaters are competing in the final round at the Olympics.

How many different ways can the skaters finish (1st, 2nd, and 3rd)?

${}_8P_3$ — 8. 336

9. The math club has 12 members and wants to send a committee of 5 students to talk to math classes. How many committees are possible?

${}_{12}C_5$ — 9. 792

Identify the following situations as dependent or independent.

10. flipping a coin and getting heads; flipping the coin a second time. — 10. independant

11. drawing a name out of a hat and not putting it back; drawing a second name out of the hat. — 11. dependant

A bag contains 2 red, 3 white, and 5 blue marbles. You pick one marble and then pick another marble. Find the following probability and circle if the even is independent or dependant.

12. P(red and white) with replacement

Circle one: (independent) or dependant

$\frac{2}{10} \cdot \frac{3}{10} = \frac{1}{5} \cdot \frac{3}{10} = \frac{3}{50}$

12. 3/50

13. P(red and red) without replacement

Circle one: independent or (dependant)

$\frac{2}{10} \cdot \frac{1}{9} = \frac{1}{5} \cdot \frac{1}{9} = \frac{1}{45}$

13. 1/45

14. P(blue and white) without replacement

Circle one: independent or (dependant)

$\frac{5}{10} \cdot \frac{3}{9} = \frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$

14. 1/6

15. P(white and white) with replacement

Circle one: (independent) or dependant

$\frac{3}{10} \cdot \frac{3}{10} = \frac{9}{100}$

15. 9/100

Identify the following as mutually exclusive or not mutually exclusive.

16. Being a male and being a teacher

16. not mutually exclusive

17. Drawing a heart and drawing a club in a deck of cards.

17. mutually exclusive

A number between 1 and 10 is randomly selected. Find the following:

18. P(number less than 4 or number greater than 8)

1 2 3 4 5 6 7 8 9 10

$\frac{3}{10} + \frac{2}{10} = \frac{5}{10} = \frac{1}{2}$

18. 1/2

19. P(1 or 6)

1 2 3 4 5 6 7 8 9 10

$\frac{1}{10} + \frac{1}{10} = \frac{2}{10} = \frac{1}{5}$

19. 1/5

20. P(1 or odd number)

1 2 3 4 5 6 7 8 9 10

$\frac{1}{10} + \frac{5}{10} - \frac{1}{10} = \frac{5}{10} = \frac{1}{2}$

20. 1/2

21. P(even number or number less than 5)

1 2 3 4 5 6 7 8 9 10

$\frac{5}{10} + \frac{4}{10} - \frac{2}{10} = \frac{7}{10}$

21. 7/10

22. An aerobics instructor has 12 songs to choose for her "Cycling" class. She wants a combination of either 6 or 7 songs for her class. How many ways can she do this if the order of the songs doesn't matter?

22. 1,716

$_{12}C_6 + {}_{12}C_7 = 924 + 792 = 1716$

23. You are trying to figure out your friend's password and want to figure out how many different possibilities there are for their password. You know that the password is 3 numbers followed by 2 letters and the letters and numbers can repeat. If the numbers must be between 0 and 9 and the letters must be between A and Z, how many possibilities is there for their password? How many possibilities is it if the numbers and letters can't be repeated?

Numbers and Letters can be repeated? $\underset{\#}{10} \cdot \underset{\#}{10} \cdot \underset{\#}{10} \cdot \underset{L}{26} \cdot \underset{L}{26} = \boxed{676{,}000}$

Numbers and Letters can't be repeated? $\underset{\#}{10} \cdot \underset{\#}{9} \cdot \underset{\#}{8} \cdot \underset{L}{26} \cdot \underset{L}{25} = \boxed{468{,}000}$

24. If 5.7% of high school baseball players go on to play baseball in NCAA, 6.1% of high school football players go on to play football in NCAA, and .5% of high school players go on to play baseball and football in NCAA.

P(play baseball or football in the NCAA) =

$P(\text{baseball}) + P(\text{football}) - P(\text{both})$

$5.7\% + 6.1\% - .5\%$

$\boxed{11.3\%}$