

## Worksheet #4 -- Adding Probabilities

1. A bag contains 6 red, 5 yellow and 3 black marbles. A marble is selected at random. What is the probability that it is a red or black marble?

m.e.  $\frac{6}{14} + \frac{3}{14} = \frac{9}{14} = .643$

2. In homeroom, 3 of the 16 girls have red hair. 2 of the 15 boys have red hair. What is the probability of selecting a boy or a red-haired person as homeroom representative to the student council?

not m.e.  $\frac{15}{31} + \frac{5}{31} - \frac{2}{31} = \frac{18}{31} = .581$

3. A letter is picked at random from the alphabet. What is the probability the letter is a vowel or contained in the word "math"?

not m.e.  $\frac{5}{26} + \frac{4}{26} - \frac{1}{26} = \frac{4}{13} = .308$

4. Two cards are drawn at random from a standard deck of cards. Find each probability:

m.e. a. P(both aces or both face cards)  $\frac{4}{52} \cdot \frac{3}{51} + \frac{12}{52} \cdot \frac{11}{51} = \frac{12}{221} = .054$

not m.e. b. P(both aces or both red)  $\frac{4}{52} \cdot \frac{3}{51} + \frac{26}{52} \cdot \frac{25}{51} - \frac{2}{52} \cdot \frac{1}{51} = \frac{55}{221} = .249$

5. From a standard deck of cards, three are dealt. What is the probability that all three are face cards or all three are red?  $\frac{12}{52} \cdot \frac{11}{51} \cdot \frac{10}{50} + \frac{26}{52} \cdot \frac{25}{51} \cdot \frac{24}{50} - \frac{6}{52} \cdot \frac{5}{51} \cdot \frac{4}{50}$

not m.e.

$$\frac{28}{221} = .127$$

6. From a standard deck of cards, one card is selected. What is the probability that it is an ace or a face card?

m.e.  $\frac{4}{52} + \frac{12}{52} = \frac{4}{13} = .308$

7. In the numbers 1 through 20, what is the probability of selecting a number at random that is a multiple of 5 or a multiple of 7?

m.e.  $\frac{4}{20} + \frac{2}{20} = \frac{3}{10} = .3$

8. From a standard deck of cards, one card is selected. What is the probability that it is a red or a face card?

not m.e.  $\frac{26}{52} + \frac{12}{52} - \frac{6}{52} = \frac{8}{13} = .615$

9. There are 8 girls and 8 boys on the faculty advisory committee. Find the probability of selecting 2 boys or 2 girls from the committee.

m.e.  $\frac{8}{16} \cdot \frac{7}{15} + \frac{8}{16} \cdot \frac{7}{15} = \frac{7}{15} = .467$

10. Suppose a student is selected at random from 100 students where 30 are taking math, 20 are taking chemistry, and 10 are taking math and chemistry. Find the probability that the student is taking mathematics or chemistry.

not m.e.  $\frac{30}{100} + \frac{20}{100} - \frac{10}{100} = \frac{2}{5} = .4$

11. A pair of dice is tossed, and the two numbers appearing on top are recorded. Find the probability the sum is 10 or more.

$$\frac{6}{36} = \frac{1}{6} = .167$$

12. A student is chosen at random to represent a committee with five freshman, eight sophomores, three juniors, and two seniors. Find the probability that the student is a

m.e. junior or senior.  $\frac{3}{18} + \frac{2}{18} = \frac{5}{18} = .278$

13. Of 120 students, 60 are studying French, 50 are studying Spanish, and 20 are studying both languages. A student is chosen at random. Find the probability that the student is studying French or Spanish.

not m.e.  $\frac{60}{120} + \frac{50}{120} - \frac{20}{120} = \frac{3}{4} = .75$

14. One card is selected at random from 50 cards numbered 1 to 50. Find the probability that the number on the card is greater than 10 or divisible by 5.

not m.e.  $\frac{40}{50} + \frac{10}{50} - \frac{8}{50} = \frac{21}{25} = .84$

15. A department store employs 28 high school students, all juniors and seniors. Six of the twelve seniors are females, and 12 of the juniors are males. One student employee is chosen at random. What is the probability of selecting a senior or a female?

not m.e.  $\frac{12}{28} + \frac{10}{28} - \frac{6}{28} = \frac{4}{7} = .571$

16. A restaurant has 5 pieces of apple pie, 4 pieces of chocolate pie, and 3 pieces of blueberry pie. If Jane selects a piece of pie at random, what is the probability that she selects either apple or chocolate?

m.e.  $\frac{5}{12} + \frac{4}{12} = \frac{3}{4} = .75$

17. At a statewide meeting, there are 20 superintendants, 13 principals, and 6 assistant principals. If one of these people is chosen at random, what is the probability that he/she is either a principal or an assistant principal?

m.e.  $\frac{13}{39} + \frac{6}{39} = \frac{19}{39} = .487$

18. An airline has one bank of 13 phones at a reservation office. Of the 13 operators who work there, 8 take reservations for domestic flights and 5 take reservations for international flights. Seven of the operators taking domestic reservations and 3 of the operators taking international reservations are female. If an operator is chosen at random, what is the probability that the person chosen takes domestic reservations or is a male?

not m.e.  $\frac{8}{13} + \frac{3}{13} - \frac{1}{13} = \frac{10}{13} = .769$

19. Each of the integers from 1 through 25 is written on a slip of paper and placed in an envelope. If one slip is drawn at random, what is the probability that the integer drawn is odd or a multiple of 5?

not m.e.  $\frac{13}{25} + \frac{5}{25} - \frac{3}{25} = \frac{3}{5} = .6$