AFM Study Guide for Probability Unit Name \_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_

Use this as just a guideline of extra problems to practice.

1. **Vocabulary** – you should be able to define, explain, compare, or give examples of the following terms.
2. Fundamental counting principal
3. Permutation – When do you use it?
4. Combination – When do you use it?
5. Mutually exclusive events or not? Give examples.
6. Independent or Dependent events? Give examples.
7. Expected value – what makes the game “fair”
8. **Practice Problems**
9. Three digit numbers are formed using the digits 2, 4, 5 and 8, with repetition of digits allowed. How many such numbers are there that are:
	1. less than 800?
	2. even?
10. A fancy restaurant offers 6 appetizers, 4 types of salads, 12 main courses and 3 desserts. In how many different ways can a customer order a meal from this restaurant?
11. Mr. Davis has 24 people, 16 female and 8 male, trying out for the school play. He wants to choose a leading male, a leading female, a supporting male, supporting female and 6 extras - 2 males and 4 females. In how many ways can the cast be chosen?
12. Art, Becky, Carl, Denise, and Ed all want to go see Carrie Underwood in concert. However, they only have 3 tickets. How many ways can they choose the three who get to go to the concert?
13. A volleyball team has nine players. In how many ways can a starting line-up be chosen consisting of two forward players and three defense players?
14. Part I of an exam has 5 multiple choice questions with 4 choices for each question. In how many different ways can this part of the exam be completed?
15. Refer to question 6, assume you randomly guess the answers at the answers. What is the probability that you do not get all answers correct?
16. A child’s game has a spinner which has spaces labeled 1 to 9 and all of the spaces are of equal size. What is the probability that the spinner stops on an odd number or a number greater than 6?
17. A bowl contains 5 oranges and 4 tangerines. Noelle randomly selects one, puts it back, and then selects another. What is the probability that both selections are tangerines?
18. A ball is randomly selected from an urn that contains five red balls, three white balls, and one yellow ball. Find the probability that the ball is red or yellow.
19. Two balls are randomly selected from an urn that contains five red balls, three white balls, and one yellow ball. If the ball is not replaced after the first is selected, find the probability that both are red.
20. You pay $0.50 to draw one card from a deck of cards. If it is an ace, you win $10; if it is a face card, you win $1; otherwise, you lose. What is the expected value of this game? Is this game fair?
21. A $1 bet is made to draw three cards from a standard deck of 52 cards. If all three cards are face cards (12 face cards in a deck), then you win $4.00. Find the expectation of this game and explain if you should play or not.
22. Suppose you surveyed the students in your class on their favorite juice flavors. Their choices were 6 apple, 10 orange, 1 grapefruit, and 3 mango. Record the probability for each flavor.
23. If a dart is thrown at the poster, what is the probability that it will land in a circle?

(watch your units!!)

1. A coin is tossed 8 times. What is the probability that you get “heads” exactly 6 times?
2. The probability that Tim will sink a foul shot is 70%. If Tim attempts 5 foul shots, what is the probability that he sinks at least 4 shots?

Answers:

Vocabulary – refer to your definitions and examples in class.

Practice Problems

1. a) 48, b) 48

2. 864

3. 201,801,600

4. 10

5. 1260

6. 1024

7. $\frac{1023}{1024}$

8. $\frac{2}{3}$

9. $\frac{16}{81}$

10. $\frac{2}{3}$

11. $\frac{5}{18}$

 12. $0.5, not fair, fair game is when EV = $0.00, explanations vary.

 13. -$0.96, not fair, explanations vary

 14. P(apple) = 6/20 = 3/10, P(orange) = 10/20 = ½, P(grapefruit) = 1/20, P(mango) = 3/20

15. 

16. 8C6(.5)6(.5)2 = 0.109375

17. 5C4(.7)4(.3) + 5C5(.7)5 = 0.5288