AFM UNIT 5 – COMBINATORICS REVIEW Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
***Determine whether each is a permutation (P) or Combination (C)***

1. Arranging 7 different books on a shelf 2. Assigning seats in a classroom

3. Selecting a class committee of 4 students 4. Choosing class officers (pres, VP, etc.)

5. Getting a poker hand of 5 cards 6. Seating 8 guests around a dinner table

***Determine if the following permutations are linear, circular, or reflective.***

7. Nine people at a round table relative to a door 8. 6 players in a huddle

9. Charms on a necklace with no clasp 10. Arranging digits of a 5 digit number

11. Keys on a key ring 12. flags strung on a flagpole

***Calculate the following using permutations, combinations, or the counting principle. SHOW YOUR WORK!***

13. Seven different letters form a 4-letter pin code. If the letters **can be repeated**, how many different codes are possible?

14. A restaurant serves 5 main dishes, 4 salads, and 8 desserts. How many different meals can be ordered if each has a main dish, a salad, and a dessert?

15. In how many ways can 7 members of a family be seated side by side in a movie theater if Dad has to sit at the one and only aisle seat?

16. There are 8 different Taylor Swift songs on iTunes. You have enough money to buy 4 of them. How many different selections are possible?

17. An exam has 5 essay questions. You are required to answer 4 of them. How many different selections are possible?

18. How many ways can you arrange 6 math books, 2 social studies cooks, and 2 science books on a shelf if the subjects must stay together?

19. Four boys and 4 girls are lining up for a photo. How many arrangements are possible if they want to alternate by gender?

20. How many ways can 6 keys be arranged on a key ring?

21. Your school yearbook has an editor-in-chief position and an assistant editor-in-chief. There are 15 students on yearbook staff. How many ways can 2 students be chosen for these positions?

22. How many ways can the word “HIPPOPOTAMUS” be arranged?

23. How many different committees can be formed from 6 teachers and 50 students if the committee must have 2 teachers and 3 students?

24. Ms. Norris and her twin are taking a picture with 6 of their friends on their birthday. How many arrangements are possible if Ms. Norris and her twin have to be in the middle?

25. Expand (2x – 3)4 using the binomial expansion formula.

26. Find the 4th term of the expansion of (a – 2b)7.

27. Find the coefficient of the 5th term of the expansion of (x – 2)8.

***Solve the following for n:***

28. $\frac{n!}{\left(n-2\right)!}=12$ 29. $\frac{\left(n-3\right)!}{\left(n-5\right)!}=42$ 30. *4! n! = 5! (n – 1)!*

***Simplify the following:***

31. $\frac{8!}{5!3!}$ 32. $\frac{5!}{3!}$ + $\frac{9!}{7!}$ 33. *(n + 1)! (n + 2)*