Nickname: _____No.___M4/15 Midterm Term 2 Re - test

1. Which of the following statements is true about $n!$?

a. $n \times (n+1) \times (n+2) \times \ldots \times 1$

b. $n-1$

c. $n \times n-1 \times n-2 \times \ldots \times 2 \times 1$

d. $n(n-1) \times n(n-2) \times \ldots \times 1$

2. Which of the following statement is equal to 1?

a. $P_{n,1}$ b. $P_{n,n}$ c. $C_{n,n}$ d. $C_{n,1}$

3. What is the value of n if $P_{n,7} = P_{n,8}$?

a. 6 b. 7 c. 9 d. 8

4. What is the value in factorial form : $\frac{(n+k-2)!}{(n+k+1)!}$?

a. $(n+k-2)(n+k-1)(n+k)$

b. $\frac{1}{(n+k-2)(n+k-1)(n+k)}$

c. $\frac{1}{(n+k+1)(n+k)(n+k-1)}$

d. $(n+k+1)(n+k)(n+k-1)$

5. Suppose $\frac{(n+3)!}{n!}$ = 504, what is the value of n?

a. 7 b. 4 c. 3 d. 6

6. Selecting 20 students from a group of 50 to attend a Math competition is an example of ____.

a. permutation

b. combination

c. fundamental counting principle

d. both permutation and combination

7. What is the value of the number in factorial form: $\frac{n!}{(n-1)!}$?

a. n

b. $(n-2)(n-3)$

c. $n(n-1)(n-2)$

d. $n(n-1)$

8. What is the value of the number in factorial form: $(n+1)(n)(n+5)(n+4)(n+3)$?

a. $\frac{n!(n+5)!}{(n-1)!((n-2)!}$ b. $\frac{(n-1)!(n+5)!}{n!(n+2)!}$

c. $\frac{(n+1)!(n+5)!}{(n-1)!(n+2)!}$ d. $\frac{n!(n+3)!}{(n-1)!(n+2)!}$

9. Given $C_{n,3} = 10$, what is the value of $P_{n,3}$?

a. 20 b. 40 c. 50 d.60

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10. Given $C_{n,13} = C_{n,15}$, what is the value of $C_{n,1}$?

a. 15 b. 18 c. 28 d. 27

11. $\frac{10!}{7!3!}$ is an example of getting a _____ of 3 things out of 10 things.

a. $P_{7,3}$ b. $C_{7,3}$ c. permutation d. combination

12. Which of the following statements is/are true?

i. 0! is equal to 0. ii. ${}_0P_5$ is equal to 0.

iii. ${}_6C_6$ is equal to 1. iv. ${}_{10}C_1$ is equal to 1.

a. i,ii, iii and iv b. i and ii c. statement iii only d. ii and iii

13. There are 6 different types of cakes in the bake shop. In how many ways can a customer select 4 different options?

a. 24 b. 48 c. 15 d. 360

For items 14 – 15. How many 3-digit numbers can be formed with the digits 1, 4, 7, 8, 9 and 0 under the following conditions:

14. If the digits are not repeated

a. 100 b. 120 c. 125 d. 18

15. If digits can be repeated

a. 100 b. 210 c. 186 d. 216

For items 16 -18. Using the numbers 1, 2, 5, 7, 8 and 9 to create a 3-digit number, without repetition. How many numbers can be created under the following conditions:

16. If the number has a value less than 500, how many numbers are there?

a. 20 b. 40 c. 60 d. 108

17. If the number created is an even number no more than 200, how many numbers are there?

a. 48 b. 8 c. 32 d. 16

18. How many 3 digits can be created (w/o repetition) ?

a. $P_{6,3}$ b. $C_{6,3}$

c. $6!$ d. $\frac{6!}{3!3!}$

19. Choosing a president, vice president, secretary and treasurer for school officers is an example of...

a. permutation b. combination

c. fundamental counting principle d. both permutation and combination

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For items 20 -22. There are 8 people, including Karen and Niko. How many ways can these people stand in a row in front of the whiteboard, under the following conditions?

20. If Karen and Niko must stand next to each other, how many ways are there?

a. 1440 b. 10080

c. 5040 d. 30240

21. If each person can stand in any position, how many ways are there?

a. 720 b. 40320

c. 12! d. 3628800

22. If Karen and Niko must stand in the first and the last row of the line, how many ways are there?

a. 720 b. 38880

c. 40320 d. 1440

23. How many different arrangements of the word "MATHEMATICS" are possible with or without meaning?

a. 4,989,600 b. 39,916,800

c. 6,930 d. 623,700

24. What is the equivalent value of $C(10,10)$?

a. 10! b. 0 c. 1 d. 10

For items 25 – 26.

Use the letters from the word "JOINTS" to form any distinct 6-letter words, how many of these arrangements will be made under the following restrictions?

25. If the 6-letter words starts with a consonant

a. 320 b. 186 c. 480 d. 20

26. If the first and the last letter must be vowels

a. 32 b. 16 c. 48 d. 12

For items 27 – 30.

A company has four female and six male workers. According to the training schedule, a group of four workers will be selected to take a training course. Find the number of different groups which will be selected containing

27. no female workers

a. 360 b. 15 c. 18 d. 25

28. only one female worker

a. 25 b. 80 c. 90 d. 75

29. exactly two female workers

a. 27 b. 25 c. 87 d. 90

30. more than two female workers

a. 18 b. 15 c. 40 d. 25

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