Republic of the Philippines
Department of Education
National Capital Region
SCHOOLS DIVISION OFFICE
Quezon City, Metro Manila

Name: _____ Date: _____
Grade & Section: _____ Score: _____

Mathematics 10
Third Diagnostic Test
S.Y. 2018–2019

Write the letter corresponding to the correct answer in the blank.
You may use the back of the paper for your computations.

_____ 1. A line passes through the center of a circle and intersects it at points $(2, 3)$ and $(8, 7)$. What is the equation of the circle?

A. $(x-5)^2+(y-5)^2=13$
B. $(x+5)^2+(y-5)^2=13$
C. $(x-5)^2+(y+5)^2=13$
D. $(x+5)^2+(y+5)^2=13$

_____ 2. Choosing a subset of a set is an example of ____.

A. Combination B. Differentiation C. Integration D. Permutation

_____ 3. $F(a, d)$, $A(c, d)$, $S(c, b)$, and $T(a, b)$ are distinct points on the coordinate plane. Which of the following statements is true?

A. $FA = AT$ B. $FS = ST$ C. $FS = AT$ D. $FT = AT$

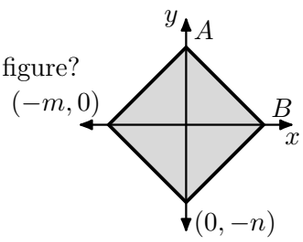
_____ 4. What are the coordinates of the center of the circle defined by the equation $x^2+(y-5)^2=8$?

A. (-5, 8) B. (0, -5) C. (5, 8) D. (0, 5)

_____ 5. Which of the following situations or activities involve permutation?

A. Matching shirts and pants
B. Forming different triangles out of 5 points on a plane, no three of which are collinear
C. Assigning telephone numbers to subscribers
D. Forming a committee from the members of a club

_____ 6. What are the coordinates of A and B in the following figure?



A. $A(-n, 0)$ and $B(m, 0)$
B. $A(0, n)$ and $B(m, 0)$
C. $A(-n, 0)$ and $B(0, -m)$
D. $A(0, n)$ and $B(0, -m)$

_____ 7. The product of a positive integer n and all the positive integers less than it is called ____.

A. powers of n B. multiples of n C. n-factors D. n-factorial

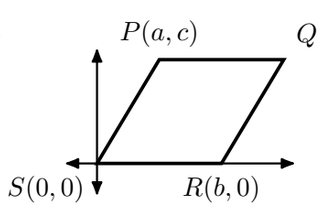
_____ 8. What figure is formed when the points $A(3, 7)$, $B(11, 10)$, $C(11, 5)$, and $D(3, 2)$ are connected consecutively?

A. Parallelogram B. Rectangle C. Square D. Trapezoid

_____ 9. Two different arrangements of objects where some of them are identical are called ____.

A. circular combinations
B. circular permutations
C. distinguishable permutations
D. unique combinations

_____ 10. In parallelogram $PQRS$, what are the coordinates of Q?

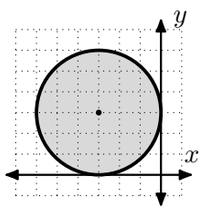


A. $(a, b+c)$
B. $(a+b, c)$
C. $(a-b, c)$
D. $(a, b-c)$

_____ 11. A radio signal can transmit messages up to a distance of 3 km. If the radio signal's origin is located at a point whose coordinates are $(4, 9)$, what is the equation of the circle that defines the boundary up to which the messages can be transmitted?

A. $(x-4)^2+(y-9)^2=3$
B. $(x-4)^2+(y-9)^2=9$
C. $(x+4)^2+(y+9)^2=3$
D. $(x+4)^2+(y+9)^2=9$

_____ 12. Which equation represents the following graph?



A. $(x-3)^2+y^2=9$
B. $x^2+(y-3)^2=9$
C. $x^2+(y+3)^2=9$
D. $(x+3)^2+(y-3)^2=9$

_____ 13. How many different 4-digit even numbers can be formed from the digits 1, 3, 5, 6, 8, and 9 if no repetition of digits is allowed?

A. 1,680 B. 840 C. 420 D. 120

_____ 14. What is the center of the circle $x^2+y^2-4x+10y+13=0$?

A. (2, 5) B. (-2, 5) C. (2, -5) D. (-2, -5)

_____ 15. In how many ways can 8 people be seated around a circular table if two of them insist on sitting beside each other?

A. 360 B. 720 C. 1,440 D. 5,040

_____ 16. On a grid map of a province, the coordinates that correspond to the location of a cellular phone tower is $(-2, 8)$ and it can transmit signals up to a 12 km radius. What is the equation that represents the transmission boundaries of the tower?

A. $x^2+y^2-4x+16y-76=0$
B. $x^2+y^2+4x-16y-76=0$
C. $x^2+y^2-4x-16y+76=0$
D. $x^2+y^2+4x-16y+76=0$

_____ 17. Find the number of distinguishable permutations of the letters of the word PASS.

A. 4 B. 12 C. 36 D. 144

_____ 18. In a town fiesta singing competition with 12 contestants, in how many ways can the organizer arrange the first three singers?

A. 132 B. 990 C. 1,320 D. 1,716

_____ 19. What is $P(8, 5)$?

A. 56 B. 336 C. 1,400 D. 6,720

_____ 20. If a combination lock must contain 5 different digits, in how many ways can a code be formed from the digits 0 to 9?

A. 15,120 B. 30,240 C. 151,200 D. 1,000,000

_____ 21. In how many ways can 4 men and 3 women arrange themselves in a row for picture taking if the men and women must stand in alternate positions?

A. 5,040 B. 720 C. 144 D. 30

_____ 22. In a room, there are 10 chairs in a row. In how many ways can 5 students be seated in consecutive chairs?

A. 720 B. 600 C. 252 D. 120

_____ 23. Which of the following situations does NOT illustrate combination?

A. Selecting 2 songs from 10 choices for an audition piece
B. Fixing the schedule of a group of students who must take exactly 8 subjects
C. Enumerating the subsets of a set
D. Identifying the lines formed by connecting some given points on a plane

_____ 24. A caterer offers 3 kinds of soup, 7 kinds of main dish, 4 kinds of vegetable dish, and 4 kinds of dessert. In how many possible ways can a caterer form a meal consisting of 1 soup, 2 main dishes, 1 vegetable dish, and 2 desserts?

A. 140 B. 336 C. 672 D. 1,512

_____ 25. In how many ways can nine different colored beads be arranged on a bracelet?

A. 720 B. 5,040 C. 40,320 D. 362,880

_____ 26. Faith bought four vanilla ice-cream cones, three chocolate cones, two strawberry cones, and five ube-langka cones for her 14 tutors. In how many ways can she distribute the cones among her tutors?

A. 2,422,520 B. 2,522,520 C. 2,622,520 D. 2,722,520

_____ 27. In how many different ways can a president, vice president, a secretary, and a treasurer be chosen from a class of 15 students?

A. 1,365 B. 3,760 C. 10,365 D. 32,760

_____ 28. A class consists of 12 boys and 15 girls. How many different committees of four can be selected from the class if each committee is to consist of two boys and two girls?

A. 6,830 B. 6,930 C. 7,030 D. 7,130

_____ 29. Mother, father, and four children stand in a circle. In how many ways can they arrange themselves if mother and father stand opposite each other?

A. 24 B. 120 C. 720 D. 5,040

_____ 30. If four persons enter a bus on which there are ten vacant seats, how many ways can the four be seated?

A. 24 B. 210 C. 5,040 D. 3,628,800

_____ 31. Brian likes to wear colored shirts. He has 10 shirts in the closet. Three of these are blue, four are in different shades of red, and the rest are of mixed or different colors. What is the probability that he will wear a blue or a red shirt?

A. $\frac{7}{10} + \frac{4}{10}$ B. $\frac{3}{10} + \frac{4}{10}$ C. $\frac{3}{10} + \frac{7}{10}$ D. $\frac{7}{10} - \frac{4}{10}$

_____ 32. A baby has 5 blocks in a box. One block is red, one is yellow, one is green, one is blue, and one is black. The baby pulls out a block, looks at it, and puts it back in the box. If he does this 4 times before he gets bored and crawls away, what is the probability that the 4 blocks selected are all of the same color?

A. $\frac{5}{5^4}$ B. $\frac{1}{5^4}$ C. $\frac{4}{5^4}$ D. $\frac{2}{5^4}$

_____ 33. In how many ways can 8 people be seated around a circular table if two of them insist on sitting beside each other?

A. 360 B. 720 C. 1440 D. 5040

_____ 34. Ms. De Leon wants to produce different sets of test questions for her essay test. If she plans to do this by putting together 3 out of 5 questions she prepared, how many different sets of questions could she construct?

A. 10 B. 20 C. 60 D. 80

_____ 35. In a town fiesta singing competition with 12 contestants, in how many ways can the organizer arrange the first three singers?

A. 132 B. 990 C. 1320 D. 1716

_____ 36. Find the number of distinguishable permutations of the letters of the word EDUCATED.

A. 1680 B. 10,080 C. 20,160 D. 40,320

_____ 37. If a combination lock must contain 5 different digits, in how many ways can a code be formed from the digits 0 to 9?

A. 15,120 B. 30,240 C. 151,200 D. 1,000,000

_____ 38. How many ways can 5 boys be seated in a row of 7 chairs?

A. 35 B. 350 C. 2250 D. 2520

_____ 39. How many ways can 7 keys be arranged in a key ring?

A. 49 B. 360 C. 720 D. 5040

_____ 40. How many ways can we arrange the letters in the word STATISTICS?

A. 18,000 B. 18,060 C. 36,500 D. 50,400

_____ 41. In the canteen, a meal order consists of appetizer, a dish and a dessert. There are 3 appetizers, 5 dishes, and 2 desserts. Find the number of ways a customer can have an order.

A. 10 B. 20 C. 30 D. 40

_____ 42. What is the number of permutation of zero objects selected from a set of 24 objects?

A. 0 B. 1 C. 24 D. does not exist

_____ 43. Evaluate: $0!(1! + 2! + 3!)$

A. 0 B. 6 C. 9 D. 12

_____ 44. How many different 5-card hands can be dealt from a deck of 52 cards?

A. C(52,5) B. C(5,52) C. P(52,5) D. P(5,52)

_____ 45. How many ways can we arrange 4 math books and 3 science books on a shelf such that books of the same kind are to be placed next to each other?

A. 288 B. 340 C. 360 D. 484

_____ 46. In how many ways can a committee of four be chosen from 5 married couples, if the committee must consist of two men and two women?

A. 10 B. 20 C. 50 D. 100

_____ 47. Sauyo High School's basketball team consists of 12 players. In how many ways can Coach Martin prepare his first five?

A. 60 B. 120 C. 620 D. 792

_____ 48. How many ways can Cinderella arrange the seven dwarfs in a round table?

A. 7 B. 720 C. 1020 D. 1900

_____ 49. How many 4-digit numbers can be formed from the digits 0,1, 2, 3, 4, and 5, if repetition of digits is not allowed?

A. 100 B. 200 C. 300 D. 400

_____ 50. Given six non-collinear, coplanar points, how many triangles can be formed using these points?

A. 6 B. 15 C. 20 D. 48

Life is the most difficult exam. Many people fail because they try to copy others, not realizing that everyone has a different question paper!