

2016 – 2017 TMSCA BANA EL Invitational Mathematics Test

1. $11\frac{1}{2} + 14\frac{3}{4} =$ _____

- A. 25.25 B. 25.5 C. 25.75 D. 26.25 E. 26.5

2. $19 - 4\frac{3}{7} =$ _____

- A. $15\frac{4}{7}$ B. $14\frac{4}{7}$ C. $15\frac{3}{7}$ D. $14\frac{3}{7}$ E. $23\frac{3}{7}$

3. $7.24 \times 14.3 =$ _____ (nearest tenth)

- A. 104 B. 104.5 C. 103.5 D. 103.4 E. 103.6

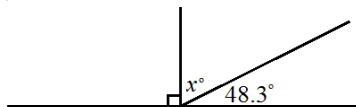
4. $0.048 \div 0.3 =$ _____ (nearest tenth)

- A. 0.2 B. 0.1 C. 0.16 D. 1 E. 0.0

5. Calculate the area of a square with a side length of 4.7 inches.

- A. 22.1 in^2 B. 21.9 in^2 C. 21.09 in^2 D. 22.01 in^2 E. 22.09 in^2

6. What is the value of x in the picture below?



- A. 131.7 B. 131.3 C. 42.7 D. 12.7 E. 41.7

7. Which value below is nineteen more than the coefficient of the term $11m^3$?

- A. $30m^3$ B. $11m^{22}$ C. 33 D. 22 E. 30

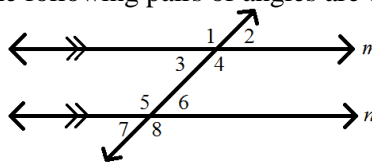
8. Let P be equal to the number of prime numbers between 30 and 50. What is the value of $P + 37$?

- A. 42 B. 41 C. 40 D. 43 E. 45

9. What is the largest palindrome less than 1,543?

- A. 1,551 B. 1,553 C. 1,441 D. 1,001 E. 2,002

10. In the picture below, $\vec{m} \parallel \vec{n}$. Which of the following pairs of angles are corresponding angles?



- A. $\angle 1$ & $\angle 7$ B. $\angle 3$ & $\angle 6$ C. $\angle 2$ & $\angle 8$ D. $\angle 5$ & $\angle 8$ E. $\angle 2$ & $\angle 7$

11. 75% of 160 is 11 more than which number below?

- A. 121 B. 109 C. 107 D. 115 E. 114

12. $4.52 \times 10^{-6} =$ _____

- A. 4,520,000 B. 0.000000452 C. 0.00000452 D. 0.0000452 E. 452,000

13. Find the sum of the next two terms in the sequence. 82, 94, 106, 118, ...

- A. 272 B. 174 C. 176 D. 156 E. 168

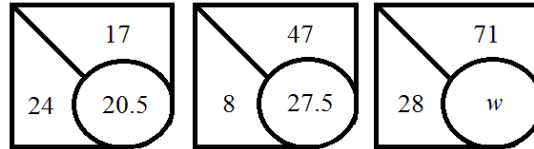
14. Find the GCF of the numbers 54 and 36.

- A. 6 B. 9 C. 18 D. 3 E. 108

15. $123,456,789 = \underline{\hspace{2cm}}$ (nearest ten-thousand)
 A. 123,456,800 B. 123,457,000 C. 123,450,000 D. 123,460,000 E. 123,500,000

16. What is the sum of the distinct prime factors of the number 390?
 A. 22 B. 21 C. 23 D. 32 E. 31

17. Use the examples below to find the value of w .

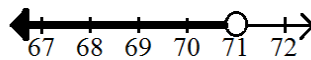


A. 53 B. 43.5 C. 31.5 D. 49.5 E. 53.5

18. Two-fifths of one-half of 540 is equal to what value?
 A. 216 B. 119 C. 162 D. 108 E. 112

19. $745 - 626 = \underline{\hspace{2cm}}$ (Roman numeral)
 A. CXIX B. CXXI C. CXVIII D. LXVII E. LXIX

20. Which inequality statement matches the picture below?



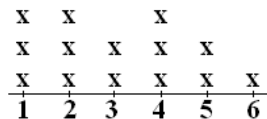
A. $a > 71$ B. $a \geq 71$ C. $a < 71$ D. $a \leq 71$ E. $a \neq 71$

21. $\frac{3}{4}\%$ = $\underline{\hspace{2cm}}$ (decimal)
 A. 75 B. 0.75 C. 7.5 D. 0.075 E. 0.0075

22. Ria bought 4 shirts for \$15 each at a garage sale. Also at the garage sale, she bought a pair of shoes for \$6 and three bracelets for \$1.25 each. If she gave the person running the garage sale a \$100 bill, how much change did Ria receive?
 A. \$30.25 B. \$34.00 C. \$34.25 D. \$69.75 E. \$22.25

23. In how many different ways can four people stand in a line?
 A. 4 B. 10 C. 256 D. 16 E. 24

24. What is the value of the median of the data in the line plot below?



A. 3.5 B. 2.5 C. 2.75 D. 3 E. 3.25

25. If today is Saturday, what day of the week will be in 100 days?
 A. Sunday B. Monday C. Tuesday D. Wednesday E. Thursday

26. Adam has 3.5 gallons of a solution that he must measure out in one-quart containers. How many containers will Adam need if he does not spill any of his solution?
 A. 7 B. 36 C. 12 D. 98 E. 14

27. Let A be the LCM of the numbers 64 and 48. Find the value of $\frac{A+8}{2}$.

- A. 100 B. 192 C. 200 D. 184 E. 104

28. How many rectangles can be found in the picture below?



- A. 5 B. 11 C. 10 D. 8 E. 12

29. Choose which of the following shapes that is convex.



30. Trisha has a bag of 300 marbles that are colored either red or green. If 44% of Trisha's marbles are red, how many marbles are green?

- A. 156 B. 132 C. 148 D. 168 E. 256

31. How many total degrees are in a regular decagon?

- A. $1,440^\circ$ B. $1,260^\circ$ C. 900° D. $1,080^\circ$ E. 720°

32. Simplify: $307 - 425 - (-18) + (-79)$

- A. -57 B. -179 C. -21 D. -215 E. -118

33. Classify the shape below.



- A. dodecagon B. nonagon C. undecagon D. decagon E. octagon

34. If $m \textcircled{O} n = m^2 - 6n$, then find the value of $6 \textcircled{O} 4$.

- A. -12 B. 21 C. 18 D. 12 E. -18

35. Choose which polynomial below is a binomial.

- A. $4x^2 + 2x - 1$ B. $3x - 1$ C. $2x^2$ D. $3x^2 + x - 1$ E. $x^3 + x^2 + x + 1$

36. $1,111 \times 56 = \underline{\hspace{2cm}}$

- A. 62,116 B. 62,216 C. 62,416 D. 62,226 E. 62,126

37. *Yummy for my Tummy* offers four breads, 6 meats, 3 cheeses, 4 condiments and 10 drinks. How many different combinations can be made if you must choose one bread, one meat, one cheese, one condiment and one drink?

- A. 2,880 B. 3,120 C. 2,460 D. 2,640 E. 2,540

38. If there are 16 pencils in a box, and you have a dozen boxes, how many pencils do you have?

- A. 96 B. 48 C. 192 D. 144 E. 256

39. Tara earns 15¢ for every candy bar she sells. If Tara earned \$9.60, how many candy bars did she sell?

- A. 84 B. 32 C. 112 D. 78 E. 64

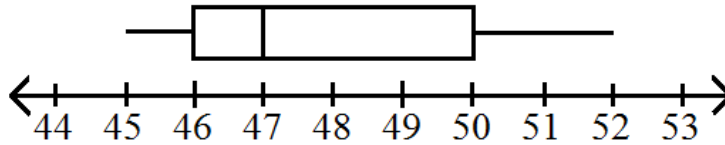
40. $14(7x + 18)$ is equivalent to which of the following?

- A. $98x + 252$ B. $21x + 32$ C. $98x + 32$ D. $7x + 32$ E. $98x + 4$

41. Which of the following numbers is not divisible by 12?

- A. 648 B. 228 C. 420 D. 486 E. 372

42. Using the box-and-whisker plot below, calculate the sum of the upper-quartile and the median.

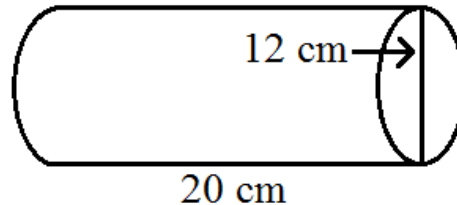


- A. 92 B. 93 C. 102 D. 99 E. 97

43. If you spend \$101.20 on eight tickets to a show, how much is each ticket worth?

- A. \$24.33 B. \$18.55 C. \$12.35 D. \$12.65 E. \$13.15

44. Calculate the total surface area of the cylinder below, let $\pi = 3$.



- A. 936 cm^2 B. 792 cm^2 C. 282 cm^2 D. $1,116 \text{ cm}^2$ E. $1,260 \text{ cm}^2$

45. On a number line, the point B is marked in the middle of the numbers 3.84 and 14.12. What number is B marked on?

- A. 8.98 B. 8.67 C. 8.68 D. 8.92 E. 8.42

46. In a pet store, the ratio of cats to dogs is 7:4. If there are 91 cats in the store, how many dogs are there?

- A. 88 B. 38 C. 52 D. 68 E. 56

47. If $\pi = 3$, the area of a circle is 9.72 cm^2 . What is the length of the diameter of the circle?

- A. 1.8 cm B. 3.6 cm C. 2.4 cm D. 4.8 cm E. 3.24

48. Which of the following is equivalent to $5! + 1$?

- A. 5^3 B. $6!$ C. $4! + 2$ D. $6! - 2$ E. 11^2

49. The sum of two positive integers is 128. If you subtract the smaller integer from the larger, the difference is 16. What is the value of the small number?

- A. 54 B. 56 C. 74 D. 64 E. 46

50. What value is seven more than the upper-quartile of the set of numbers? 4, 9, 9, 11, 18, 24, 25, 28, 29, 30

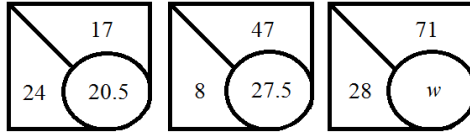
- A. 28 B. 42 C. 19 D. 35 E. 26

2016 – 2017 TMSCA BANA EL Invitational Mathematics Test Answer Key

1. D	18. D	35. B
2. B	19. A	36. B
3. C	20. C	37. A
4. A	21. E	38. C
5. E	22. A	39. E
6. E	23. E	40. A
7. E	24. D	41. D
8. A	25. B	42. E
9. C	26. E	43. D
10. E	27. A	44. A
11. B	28. B	45. A
12. C	29. C	46. C
13. A	30. D	47. B
14. C	31. A	48. E
15. D	32. B	49. B
16. C	33. D	50. D
17. D	34. D	

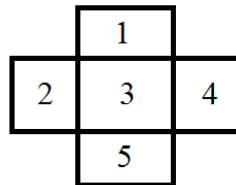
6. The three angles in the picture must sum to 180° . Make an equation, $90 + x + 48.3 = 180$. This simplifies to $x + 138.3 = 180$. Subtract 138.3 from both sides and you get $x = 41.7$.

17. Using the picture below,



We see that the number in the circle is the average of the two outside numbers. $\frac{24+17}{2} = 20.5$ and $\frac{8+47}{2} = 27.5$. Therefore, $\frac{28+71}{2} = \frac{99}{2} = 49.5 = w$.

28. You are asked to find the total number of rectangles. First, label each section as below.



Now, make a list of rectangles. We have 1, 2, 3, 4, 5, 13, 23, 34, 35, 135 and 234. There are a total of 11 rectangles in the figure.

30. First, find the percentage of marbles that are green, $100\% - 44\% = 56\%$. Now we want to find 56% of 300 = $0.56(300) = 168$ green marbles.

31. The formula to find the total degrees of a polygon is $(n - 2)180$, where n equals the number of sides of the polygon. A decagon is a polygon with 10 sides. Therefore, $(10 - 2)(180) = 1,440$ total degrees.

34. If $m \textcircled{O} n = m^2 - 6n$, then $6 \textcircled{O} 4 = 6^2 - 6(4) = 36 - 24 = 12$.

40. The Distributive Property is $a(b + c) = a \cdot b + a \cdot c = ab + ac$. We are given $14(7x + 18)$, which is equal to $14(7x + 18) = 14 \cdot 7x + 14 \cdot 18 = 98x + 252$.

45. to find what number B is marked on first subtract 3.84 from 14.12 and then divide that difference by 2. $14.12 - 3.85 = 10.28$ and $\frac{10.28}{2} = 5.14$. Now, add 5.14 to 3.84 or subtract 5.14 from 14.12 and either way you get the number 8.98.

46. Let x be our constant value. We are given the ratio of 7 cats to 4 dogs and that there are 91 cats. Therefore, we can create the equation $7x = 91$. Divide both sides by 7 and we get $x = 13$. Now we can multiply 13 by 4 and get a total of $13(4) = 52$ dogs.