

**TMSCA MIDDLE SCHOOL
MATHEMATICS
TEST #7 ©
JANUARY 18, 2020**

GENERAL DIRECTIONS

- About this test:
 - You will be given 40 minutes to take this test.
 - There are 50 problems on this test.
- All answers must be written on the answer sheet/Scantron form/Chatsworth card provided. If you are using an answer sheet be sure to use **BLOCK CAPITAL LETTERS**. Clean erasures are necessary for accurate grading on Scantrons and Chatsworth cards.
- If you are using a Chatsworth or Scantron card, please follow the specific instructions given at your particular meet.
- You may write anywhere on the test itself. You must write only answers on the answer sheet.
- You may use additional scratch paper provided by the contest director.
- All problems have **ONE** and **ONLY ONE** correct [BEST] answer. There is a penalty for all incorrect answers.
- Calculators **MAY NOT** be used on this test.
- All problems answered correctly are worth **FIVE** points. **TWO** points will be deducted for all problems answered incorrectly. No points will be added or subtracted for problems not answered.
- In case of ties, percent accuracy will be used as a tie breaker.

1. $-0.09 + 4.2 + (-0.005) =$ _____ (nearest hundredth)
 A. 4.01 B. 4.11 C. 4.10 D. 4.12 E. 4.14

2. $81\frac{1}{4} - 17\frac{1}{2} =$ _____
 A. $64\frac{1}{2}$ B. $63\frac{3}{4}$ C. $63\frac{1}{2}$ D. $64\frac{3}{4}$ E. $64\frac{1}{4}$

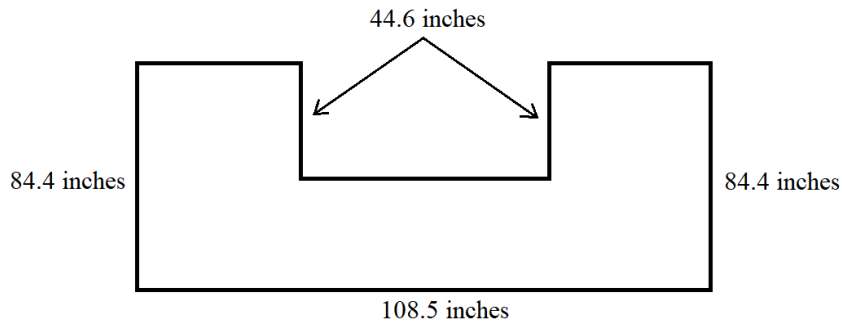
3. $1,848 \div 14 \div 6 =$ _____
 A. 24 B. 12 C. 34 D. 22 E. 30

4. $1.4 \times 0.07 =$ _____ (nearest integer)
 A. 1 B. 2 C. 0 D. -1 E. 5

5. What is the greatest palindrome less than 1,562?
 A. 1,551 B. 1,661 C. 1,001 D. 1,991 E. 999

6. $54\frac{7}{16} =$ _____ (decimal to the nearest hundredths)
 A. 54.4275 B. 54.43 C. 54.428 D. 54.44 E. 54.4

7. What is the perimeter of the shape below?



A. 643.8 inches B. 237.5 inches C. 321.9 inches D. 475 inches E. 366 inches

8. $\$25.61 = 60$ quarters $+ 8$ dimes $+$ _____ nickels $+ 1$ penny
 A. 172 B. 196 C. 212 D. 202 E. 188

9. How many positive integers will evenly divide into the number 220?
 A. 12 B. 32 C. 24 D. 14 E. 18

10. What number when divided by 23, gives a quotient of 6 with a remainder of 12?
 A. 142 B. 150 C. 175 D. 185 E. 163

11. Cole goes into a sandwich shop and orders the lunch special. For the lunch special, Cole has the option of the tomato soup or a side salad, with a sandwich. The sandwich can be on white or wheat bread, with three choices of meats and two choices of condiments. Cole's sandwich must only have one meat and one condiment. How many choices for the lunch special does Cole have to choose from?
 A. 36 choices B. 32 choices C. 12 choices D. 24 choices E. 16 choices

12. 8 pints = _____ cups
 A. 32 B. 16 C. 4 D. 2 E. 64

13. Simplify: $((8 - 12)^2 - (9 - 4)^2 - 6)^2$
 A. 196 B. 169 C. 225 D. 144 E. 256

14. $0.5\bar{3} =$ _____ (fraction)

- A. $\frac{53}{90}$ B. $\frac{5}{11}$ C. $\frac{7}{16}$ D. $\frac{28}{45}$ E. $\frac{8}{15}$

15. What value is seven less than the LCM of the numbers 34 and 16?

- A. 279 B. 274 C. 272 D. 267 E. 265

16. $5.65 \times 10^4 - 3.7 \times 10^3 =$ _____ (scientific notation)

- A. 1.95×10^4 B. 1.95×10^3 C. 5.613×10^4 D. 5.28×10^3 E. 5.28×10^4

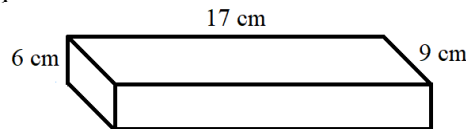
17. Which set of numbers below has the greatest product?

- A. $\{-5, 6, 11\}$ B. $\{-8, -13, -15\}$ C. $\{6, 11, 5\}$ D. $\{-7, 4, -15\}$ E. $\{8, -22, 4\}$

18. 9 square yards = _____ square feet

- A. 36 B. 108 C. 81 D. 27 E. 729

19. Tamika has two identical rectangular prisms as the one shown below. What is the volume of Tamika’s prisms?



- A. 896 cm^3 B. 918 cm^3 C. $1,728 \text{ cm}^3$ D. $1,948 \text{ cm}^3$ E. $1,836 \text{ cm}^3$

20. The sum of three consecutive integers is 192. What is the value of eleven more than the largest integer?

- A. 76 B. 75 C. 77 D. 74 E. 78

21. The tax rate in San Antonio is 8.4%. What will be the total cost be of buying an item marked \$15.00?

- A. \$12.60 B. \$16.06 C. \$15.84 D. \$16.32 E. \$16.26

22. $6,349 =$ _____ (Roman numeral)

- A. $\overline{DCXXXLIV}$ B. $\overline{DCCCXLIV}$ C. $\overline{VMCCCXLIX}$ D. $\overline{VDCCXLIX}$ E. $\overline{VMCDXLIX}$

23. Solve for n : $17 - n \leq 54$

- A. $n \leq 71$ B. $n \leq 37$ C. $n \geq 37$ D. $n \geq -37$ E. $n \leq -37$

24. The mean of A , B and 19 is 21. What is the average of A and B ?

- A. 22 B. 23 C. 20 D. 21 E. 24

25. James has three dimes, five quarters and six pennies in his pocket. If James reaches in his pocket and draws out one coin, what are the odds he draws a quarter?

- A. 5:14 B. 5:9 C. 9:14 D. 1:3 E. 5:19

26. 198 feet/second = _____ miles/hour

- A. 161 B. 135 C. 147 D. 141 E. 165

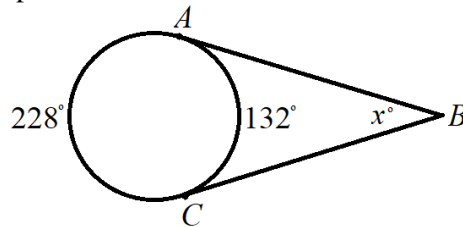
27. $169_{14} =$ _____₁₀

- A. 277 B. 279 C. 283 D. 289 E. 295

28. What is the slope of the line with the equation $8x - 10y = 24$?

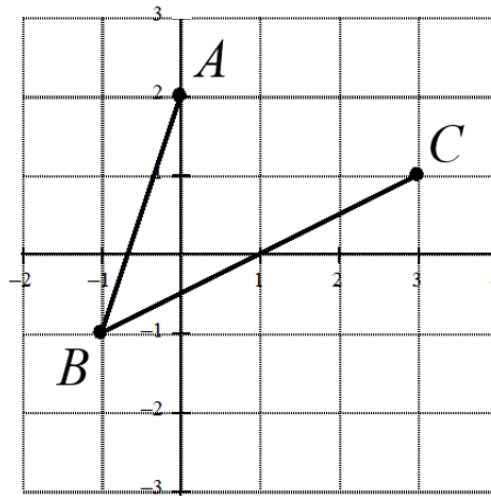
- A. $-\frac{12}{5}$ B. 3 C. $\frac{1}{3}$ D. $\frac{4}{5}$ E. $-\frac{5}{24}$

29. What is the 18th digit to the right of the decimal point in the decimal expansion of $\frac{1}{11}$?
 A. 0 B. 7 C. 4 D. 6 E. 9
30. A bicycle lock is a 3-digit number, where no digit repeats. If the product of the digits is 120, and the digits appear in decreasing order from left to right, which of the following could be the first digit?
 A. 10 B. 5 C. 8 D. 7 E. 4
31. One of the zip codes in Houston is 77071. How many permutations are there of the numbers in that zip code?
 A. 30 B. 45 C. 15 D. 40 E. 20
32. $16(4\sqrt{27})$ is equivalent to which of the following, in simplest radical form?
 A. $64\sqrt{27}$ B. $96\sqrt{3}$ C. $576\sqrt{3}$ D. $192\sqrt{3}$ E. $48\sqrt{3}$
33. What is the positive difference between 5% of 300 and 4% of 200?
 A. 7 B. 9 C. 6 D. 10 E. 11
34. What is the value of the lower quartile for the set of numbers 22, 24, 42, 43, 84, 11, 56, 24, and 74?
 A. 24 B. 23 C. 42 D. 73 E. 11
35. What is the growth rate of the exponential growth function $y = \frac{4}{5}\left(\frac{5}{2}\right)^x$?
 A. 200% B. 250% C. 80% D. 180% E. 150%
36. If $f(x) = \frac{4x-9}{2}$ and $g(x) = \frac{30}{2x}$, then what is the value of $f(g(5))$?
 A. 2.5 B. 1.5 C. 8.4 D. 6.25 E. 4.75
37. The legs of a right triangle measure 5 cm and 12 cm. If the triangle is dilated by a scale factor of 3, what is the perimeter of the new triangle?
 A. 1,560 cm B. 60 cm C. 270 cm D. 90 cm E. 120 cm
38. What is the probability of rolling a pair of dice and getting a sum of 6 or 10?
 A. $\frac{2}{9}$ B. $\frac{4}{9}$ C. $\frac{5}{18}$ D. $\frac{1}{3}$ E. $\frac{7}{18}$
39. Point C is the midpoint of \overline{AB} . What are the coordinates of point B , if point A has coordinates (17, 14) and point C has coordinates (-33, 48)?
 A. (49, 17) B. (-49, 34) C. (-83, 82) D. (-49, -34) E. (-8, 31)
40. What is the sum of the two linear factors of $x^2 + 7x - 44$?
 A. $x + 7$ B. $2x - 4$ C. $2x + 15$ D. $2x - 44$ E. $2x + 7$
41. \overline{AB} and \overline{CB} are tangent to the circle at points A and B . What is the value of x ?

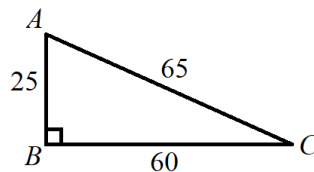


- A. 114 B. 66 C. 33 D. 48 E. 57

42. Wanda’s age is fifteen less than twice Maurice’s age. The sum of their ages is one-third of 198. How old is Maurice?
 A. 27 B. 33 C. 21 D. 39 E. 36
43. Which of the following sets is not a Pythagorean Triple?
 A. {3, 5, 4} B. {13, 5, 12} C. {15, 20, 25} D. {7, 24, 25} E. {16, 36, 34}
44. What is the decimal representation of $4 + \frac{1}{1 + \frac{1}{4}}$?
 A. 4.6 B. 4.5 C. 4.2 D. 4.4 E. 4.8
45. If the points (21, 56) and (45, y) each lie on the same graph of a direct variation, what is the value of y?
 A. 80 B. 120 C. 96 D. 112 E. 128
46. Using the picture below, what is the measure of $\angle ABC$?



- A. 30° B. 60° C. 45° D. 35° E. 75°
47. Clint played in a basketball tournament last week. Over the tournament, Clint scored 59 points by making 26 baskets consisting of both 2 and 3-pointers. How many 2-pointers did Clint make?
 A. 17 B. 7 C. 16 D. 19 E. 22
48. If $f(x) = x^2 + 3x$, find $f(x + 3)$.
 A. $x^2 + 6x + 12$ B. $x^2 + 6x + 18$ C. $x^2 + 12x + 36$ D. $x^2 + 9x + 36$ E. $x^2 + 9x + 18$
49. A fireworks bottle-rocket is launched from a platform above the ground. The rocket will fall to the ground after exploding at its maximum height reached. The bottle-rocket’s height above the ground is given by the quadratic function $h(x) = -16x^2 + 64x + 84$. What is the maximum height the bottle-rocket will reach?
 A. 150 feet B. 142 feet C. 156 feet D. 148 feet E. 152 feet
50. Using the triangle below, what is the trig ratio, $\sin \angle C$?



- A. $\frac{5}{13}$ B. $\frac{5}{12}$ C. $\frac{12}{13}$ D. $\frac{13}{12}$ E. $\frac{13}{5}$

2019 – 2020 TMSCA Middle School Mathematics Test #7 Answer Key

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

16. $5.65 \times 10^4 - 3.7 \times 10^3 = 56,500 - 3,700 = 52,800 = 5.28 \times 10^4$.

18. Since 1 square yard = 9 square feet, 9 square yards is equal to $9 \times 9 = 81$ square feet.

22. $6,349 = 6,000 + 300 + 40 + 9$. Since $6,000 = \bar{V}M$, $300 = CCC$, $40 = XL$, and $9 = IX$, then the number 6,349 is equal to $\bar{V}MCCCXLIX$ using Roman numerals.

24. If the mean of A , B and 19 is 21, then we can write the equation $\frac{A+B+19}{3} = 21$. Now, we multiply each side by 3 to get $A + B + 19 = 63$. Subtract 19 from both sides and we get $A + B = 44$. Since there are two numbers remaining, the average of A and B is then $\frac{A+B}{2} = \frac{44}{2} = 22$.

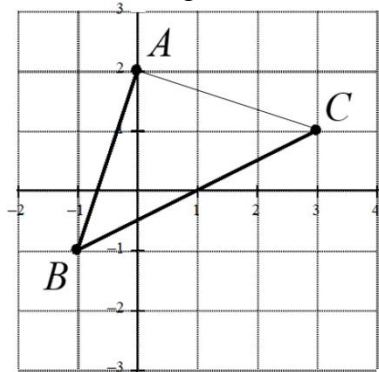
29. $\frac{1}{11} = 1 \div 11 = 0.\overline{09}$. Therefore, the 18th digit to the right of the decimal will be 9.

32. $16(4\sqrt{27}) = 16(4 \cdot \sqrt{9 \cdot 3}) = 16(4 \cdot 3\sqrt{3}) = 16(12\sqrt{3}) = 192\sqrt{3}$.

33. 5% of 300 is equal to $0.05(300) = 15$. 4% of 200 is equal to $0.04(200) = 8$. Thus, $15 - 8 = 7$.

40. The linear factors of $x^2 + 7x - 44$ are $(x - 4)(x + 11)$. Therefore, their sum is $x - 4 + x + 11 = 2x + 7$.

41. Draw a segment from A to C . The slope of \overline{AB} is 3 and the slope of \overline{AC} is $-\frac{1}{3}$, and since the two slopes are



negative reciprocal slopes, $\overline{AB} \perp \overline{AC}$ and $m\angle BAC = 90^\circ$. The distance of

$$\overline{AB} = \sqrt{(0 - (-1))^2 + (2 - (-1))^2} = \sqrt{10}, \text{ and the distance}$$

$$\overline{AC} = \sqrt{(0 - 3)^2 + (2 - (-1))^2} = \sqrt{10}. \text{ Since } AB = AC, \Delta ABC \text{ is a right}$$

isosceles triangle. This means $m\angle ABC = m\angle ACB$ and $180 - 90 = 90$.

Therefore, $90 \div 2 = 45$, so $m\angle ABC = 45^\circ$.

44. $4 + \frac{1}{1+\frac{1}{4}} = 4 + \frac{1}{\frac{4+1}{4}} = 4 + \frac{1}{\frac{5}{4}} = 4 + 1 \div \frac{5}{4} = 4 + \frac{4}{5} = 4\frac{4}{5} = 4.8$.

47. We need to make a system of equations. If $A = 2$ -pointers and $B = 3$ -pointers, we have the system of linear equations $\begin{cases} A + B = 26 \\ 2A + 3B = 59 \end{cases}$. We are asked to find the number of 2-pointers, so we want to eliminate the 3-

pointers. Multiply the first equation by -3 and we get $\begin{cases} -3A - 3B = -78 \\ 2A + 3B = 59 \end{cases}$. Adding the two equations together and we get $-A = -19$. Dividing both sides by -1 and $A = 19$, so the number of 2-pointers made was 19.

48. If $f(x) = x^2 + 3x$, then $f(x + 3) = (x + 3)^2 + 3(x + 3) = x^2 + 3x + 3x + 9 + 3x + 9 = x^2 + 6x + 18$.