T M S C A M I D D L E S C H O O L

M A T H E M A T I C S

T E S T # 1 ©

O C T O B E R 2 5, 2 0 1 4

GENERAL DIRECTIONS

1. About this test:
   A. You will be given 40 minutes to take this test.
   B. There are 50 problems on this test.
2. 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.
3. If using a scantron answer form be sure to correctly denote the number of problems not attempted.
4. You may write anywhere on the test itself. You must write only answers on the answer sheet.
5. You may use additional scratch paper provided by the contest director.
6. All problems have **ONE** and **ONLY ONE** correct [BEST] answer. There is a penalty for all incorrect answers.
7. Calculators **MAY NOT** be used on this test.
8. 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.
9. In case of ties, percent accuracy will be used as a tie breaker.

2014-2015 TMSCA Middle School Mathematics Test #1

1. 200.02 – 98.6 = _____

A. 100.42 B. 298.62 C. -101.42 D. 101.6 E. 101.42

2. $4\frac{2}{3} + 19\frac{4}{5}$ =_____

A. $23\frac{2}{5}$ B. $23\frac{7}{15}$ C. $24\frac{3}{4}$ D. $24\frac{7}{15}$ E. $24\frac{7}{8}$

3. $4.5 \times 9 =$ _____

A. 0.5 B. 40.5 C. 13.5 D. 2 E. 36.5

4. $100{,}428 \div 4 =$ _____

A. 25,107 B. 401,712 C. 2,510.7 D. 25,712 E. 25,102

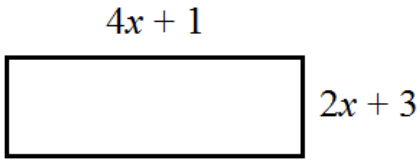
5. The point (-7, 8) is reflected over the *x*-axis. What are the point's new coordinates?

A. (-8, 7) B. (-7, -8) C. (7, 8) D. (7, -8) E. (-8, -7)

6. Find the Least Common Multiple of the numbers 72 and 84.

A. 4 B. 12 C. 252 D. 504 E. 456

7. If x = 5 inches, find the perimeter of the rectangle below.



A. 34 inches B. 40 inches C. 68 inches D. 88 inches E. 273 inches

8. Which of the following is the correct prime factorization of 200?

A. $2^3 \cdot 5$ B. $2^3 \cdot 3 \cdot 5$ C. $2^3 \cdot 5^2$ D. $3 \cdot 5^3$ E. $2^2 \cdot 3^2 \cdot 5^2$

9. If two angles sum to 180 degrees, they are _____ angles.

A. vertical B. supplementary C. complementary D. alternate interior E. corresponding

10. Let *m* equal the remainder when 621 is divided by 6. What is the value of *m* + 18?

A. 19 B. 3 C. 21 D. 16 E. 18

11. $11{,}111^2$ = _____

A. 1,222,221 B. 123,454,321 C. 124,454,321 D. 135,797,531 E. 124,686,421

12. How many lines of symmetry can be drawn in a regular hexagon?

A. 12 B. 8 C. 10 D. 6 E. 3

13. As a decimal, an irrational number is a non-repeating and non-terminating decimal. Which of the following is an example of an irrational number?

A. 1.7654 B. $23.\overline{21}$ C. ½ D. $\sqrt{2}$ E. $\frac{34}{4}$

14. Write the number 32,000,000,000 in scientific notation.
A. 3.2×10^{-10} B. 32×10^{10} C. 3.2×10^{10} D. 0.32×10^{10} E. 3.2×10^{9}

15. Simplify: $3(5-8)-(11-2)+2(4+1+2+3)^2$
A. 182 B. 230 C. 200 D. 22 E. 44

16. 40 centimeters + 20 decimeters + 1 meter = _____ millimeters
A. 340 B. 34 C. 61 D. 3,400 E. 34,000

17. Using the stem-and-leaf plot below, which of the following is five more than the median?

1	0	1	
2	0	0	5
3	7		
4	3	4	5

key: 1|0 = 10

A. 22.5 B. 30 C. 25 D. $33.\overline{3}$ E. 27.5

18. What is the unit rate of a dozen apples costing $4.08?
A. $0.34 per apple B. $0.31 per apple C. $0.37 per apple D. $0.28 per apple E. $0.32 per apple

19. ΔABC has $\angle A = 33.25^\circ$ and $\angle B = 71.19^\circ$. What is the measure of $\angle C$?
A. 255.56° B. 75.56° C. 55.76° D. 255.46° E. 95.56°

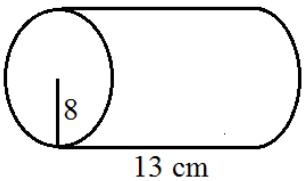
20. Lebron watched a movie that was 1.45 hours long. How long was the movie Lebron watched in minutes?
A. 105 B. 60.45 C. 87 D. 105.5 E. 64.5

21. 9 pounds = _____ ounces
A. 16 B. 132 C. 36 D. 144 E. 1,152

22. What is the next number in the sequence 0, 1, 1, 2, 3, 5, 8, 13, 21, …?
A. 42 B. 29 C. 39 D. 58 E. 34

23. 4.56 = _____%
A. 4.56 B. 45.6 C. 0.456 D. 0.0456 E. 456

24. Calculate the lateral surface area of the cylinder below. Let $\pi = 3$.



A. 1,008 cm^2 B. 624 cm^2 C. 104 cm^2 D. 832 cm^2 E. 728 cm^2

25. $\{1, 2, 3, 4, 5, 6, 7, 8, 9\} \cup \{2, 4, 6, 8, 10, 12\}$ produces a set with _____ elements.
A. 11 B. 15 C. 4 D. 7 E. 9

26. Simplify: $4(2x - 9) + 24$
A. $6x + 19$ B. $6x - 36$ C. $8x + 19$ D. $8x + 15$ E. $8x - 12$

27. Cassandra wants to buy a shirt that costs $28.00. If tax is 8.5%, how much tax will Cassandra have to pay?
A. $2.42 B. $2.72 C. $2.38 D. $30.38 E. $29.42

28. *Crunchy Tacos* produces 48 tacos in 15 minutes. At this rate, how many tacos will *Crunchy Tacos* produce in 2.5 hours?
A. 480 B. 192 C. 288 D. 1,800 E. 600

29. 34_8 = _____$_{10}$
A. 18 B. 22 C. 24 D. 28 E. 31

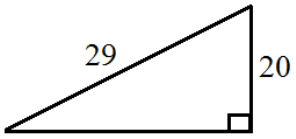
30. What is the area of a square with a diagonal of 16 meters?
A. 256 m^2 B. 128 m^2 C. 320 m^2 D. 64 m^2 E. 512 m^2

31. 5! = _____
A. 5 B. 15 C. 125 D. 625 E. 120

32. 2 square miles = _____ acres
A. 1,512 B. 3,200 C. 1,280 D. 1,420 E. 1,160

33. 512 – 360 + 47 – 100 + 6 = _____ (Roman numeral)
A. DXV B. CV C. XCV D. LXXV E. MV

34. What is the length of the missing side of the triangle below?



A. 21 units B. 23 units C. 18 units D. 35 units E. 26 units

35. $\frac{4}{45}$ = _____(decimal)
A. 0.089 B. 0.088 C. $0.0\overline{8}$ D. 0.075 E. $0.0\overline{89}$

36. 7 + 9 + 11 = 11 + 9 + 7 illustrates which property correctly?
A. Associative B. Distributive C. Reflexive D. Commutative E. Identity

37. What is the 31st term of the sequence -4, -2, 0, 2, 4, 6, …?
A. 56 B. 58 C. 60 D. 62 E. 64

38. Factor completely: $36m^3 + 18m$
A. $18m(2m^2 + 1)$ B. $36(m^3 + ½)$ C. $18(2m^3 + m)$ D. unfactorable E. $9m(4m^2 + 2)$

39. Lucy wants to arrange her spices in a line. She has 6 different spice containers. How many ways can Lucy arrange her spices?

A. 180 B. 120 C. 720 D. 840 E. 640

40. Simplify: $\frac{81x^2}{27x^{-3}}$

A. $54x^2$ B. $3x^{-5}$ C. $9x^5$ D. $3x^3$ E. $3x^5$

41. What is the x-intercept of the graph of the linear equation $3y = 7x - 42$?

A. -6 B. 6 C. 14 D. -14 E. -42

42. Multiply: $(3m - 2n)(2m - 5n)$

A. $5m - 7n$ B. $6m^2 - 11mn + 10n^2$ C. $6m^2 - 19mn + 10n^2$ D. $6m^2 + 10n^2$ E. $5m^2 - 7n^2$

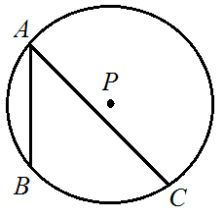
43. $3^5 - 3^3 =$ _____

A. 243 B. 27 C. 9 D. 189 E. 216

44. Simplify: $-12\sqrt{48}$

A. $-16\sqrt{3}$ B. $-8\sqrt{3}$ C. $-24\sqrt{3}$ D. $-48\sqrt{3}$ E. $-192\sqrt{3}$

45. Using the picture of $\odot P$ below, if arc BC $= 104^\circ$, then $m\angle BAC =$ ____$^\circ$.



A. 104 B. 156 C. 27 D. 52 E. 81

46. Find the discriminant of the quadratic equation $y = 2x^2 - 3x + 1$.

A. -1 B. 0 C. 1 D. 1.5 E. ½

47. Solve for x: $\frac{1}{5}x + \frac{1}{3}x = 1$

A. $x = 1.875$ B. $x = 1.125$ C. $x = 1.\overline{6}$ D. $x = 0.6$ E. 1.375

48. What is the sum of the coordinates of the center of the circle with the equation $(x - 6)^2 + (y + 19)^2 = 4$?

A. -13 B. 13 C. 23 D. -2 E. -25

49. Which of the following below is not a trig function?

A. sine B. associative C. cosine D. tangent E. secant

50. What is the product of the coordinates of the solution to the system $\begin{cases} 3x = y - 8 \\ y = 6x + 2 \end{cases}$?

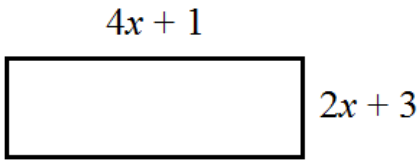
A. 28 B. 16 C. 54 D. 36 E. 12

2014-2015 TMSCA Middle School Mathematics Test #1 Answer Key

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

2014-2015 TMSCA Middle School Mathematics Test #1 Selected Answers

7. If $x = 5$, to find the perimeter of the rectangle below, substitute 5 in for x and use the formula $P = 2l + 2w$.



$P = 2(4 \cdot 5 + 1) + 2(2 \cdot 5 + 3)$
$P = 2(21) + 2(13)$
$P = 68$ units

37. The sequence -4, -2, 0, 2, 4, 6, …is an arithmetic sequence. To find the nth term of an arithmetic sequence, use the formula $a_n = a_1 + (n - 1)d$, where a_n is the value we are looking for, a_1 is the first term of the sequence, n is the position of the term we want and d is the common difference. Therefore, $a_{31} = -4 + (31 - 1)(2) = -4 + (30)(2) = -4 + 60 = 56$.

43. To simplify $3^5 - 3^3$, first factor out the 3^3. $3^5 - 3^3 = 3^3(3^2 - 1)$. $3^3 = 27$ and $3^2 - 1 = 8$, so $3^5 - 3^3 = 27(8) = 216$.

46. The standard form of a quadratic equation is $y = Ax^2 + Bx + C$. To find the discriminant of a quadratic equation, use $B^2 - 4AC$. We are given the quadratic equation $y = 2x^2 - 3x + 1$. Substituting into our formula and we get $(-3)^2 - 4(2)(1) = 1$.

47. Solve: $\frac{1}{5}x + \frac{1}{3}x = 1$. First, find the common denominator, which is 15. Now we have $\frac{3}{15}x + \frac{5}{15}x = 1$. Add the fractions and we get $\frac{8}{15}x = 1$. Multiply both sides by $\frac{15}{8}$ and $x = \frac{15}{8}$. All the answer choices are in decimal form, so $\frac{15}{8} = 1.875$.