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 # 3 ©

N O V E M B E R 8 , 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.

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2014-2015 TMSCA Middle School Mathematics Test #3

1. 5,001 + 12,999 = _____

A. 17,000 B. 8,000 C. -7,998 D. 18,000 E. 17,999

2. 401,003 – 99,739 = _____

A. 301,264 B. 500,742 C. 598,736 D. 301,561 E. 301,564

3. $\frac{3}{4} \cdot \frac{64}{39} =$_____

A. $1\frac{3}{16}$ B. $1\frac{3}{13}$ C. $1\frac{5}{16}$ D. $1\frac{5}{13}$ E. $2\frac{3}{16}$

4. $4.1248 \div 0.06 =$ _____ (nearest hundredth)

A. 68.746 B. 68.747 C. 68.7 D. 68.74 E. 68.75

5. π is an example of which of the following numbers?

A. rational B. irrational C. integer D. imaginary E. natural

6. Evaluate $4m + \frac{3n}{5}$ for m = 17 and n = -15.

A. 59 B. 28.6 C. 65.6 D. 77 E. 65

7. One Saturday, Peyton and Sheila started playing video games at 2:24 pm. They took a one and a half hour break for lunch, a twenty minute break for the restroom and then a quarter-hour break for a snack. If the time playing video games were continuous without any breaks, Peyton and Sheila would have played for 3 hours. At what time did Peyton and Sheila finish playing video games?

A. 7:43 pm B. 7:29 pm C. 5:51 pm D. 6:37 pm E. 6:57 pm

8. Simplify: $4a - 3b + 7a + a + a - 6b - b + 2a + 2b - a - b$

A. $14a - 7b$ B. $15a - 7b$ C. $14a - 9b$ D. $15a - 8b$ E. $14a - 8b$

9. What is the sum of the number of edges, vertices and faces of a hexagonal prism?

A. 48 B. 36 C. 42 D. 40 E. 38

10. \$54.40 = _____ dimes + 540 nickels

A. 29.4 B. 34.7 C.324 D. 274 E. 268

11. 1.5 kilograms + 45 centigrams = _____ grams

A. 1,545 B. 1,504.5 C. 1,500.45 D. 1,500.045 E. 4,650

12. Find the GCF of the numbers 24, 36, and 84.

A. 18 B. 6 C. 2 D. 4 E. 12

13. Simplify: $4 - 3^2 + 2^3 + 7^0$

A. 4 B. 5 C. 7 D. 8 E. 6

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14. 21 pounds = _____ ounces

A. 336 B. 168 C. 672 D. 84 E. 42

15. $\sqrt{784}$ is an example of a(n) _____ number.

A. irrational B. imaginary C. rational D. exponential E. apex

16. Let $A = 72$. Find the sum of A, the additive inverse of A and the opposite of A?

A. 36 B. -36 C. 72 D. -72 E. 0

17. $76 \cdot 7 =$ _____ (Roman numeral)

A. *LXXXII* B. *MMXXXII* C. *DXXXII* D. *CCCXXII* E. *CDXXXII*

18. How many total degrees are there in a concave hexagon?

A. 540° B. 720° C. 900° D. $1{,}080^\circ$ E. $1{,}160^\circ$

19. If the area of a circle is equal to 196π in^2, then its diameter is equal to _____ inches.

A. 7 B. 14 C. 28 D. 98 E. 49

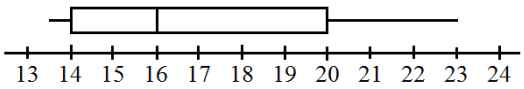
20. To make a dozen cookies, Aneesa needs six eggs. How many eggs will she need to make thirty cookies?

A. 1 ¼ dozen B. 1 ½ dozen C. 1 ¾ dozen D. ¾ dozen E. ½ dozen

21. Solve for x: $\frac{2}{3}x - 1 = 13$

A. $x = 9.\overline{3}$ B. $x = 28$ C. $x = 21$ D. $x = 20.5$ E. $x = 9.\overline{6}$

22. Using the box-and-whisker plot below, what value is five more than the median?



A. 18.5 B. 19 C. 21 D. 25 E. 16

23. 1¼ % = _____(decimal)

A. 1.25 B. 0.00125 C. 0.125 D. 0.0125 E. 125

24. If the area of a square is 225 m^2, what is the square's perimeter?

A. 15 meters B. 56.25 meters C. 76 meters D. 30 meters E. 60 meters

25. $19 \div 0.0002 =$ _____(scientific notation)

A. 9.5×10^4 B. 3.8×10^4 C. 0.95×10^5 D. 3.8×10^5 E. 9.5×10^3

26. What is the mean of the set of numbers 34, 35, 54, 61, 26?

A. 40 B. 40.5 C. 41 D. 41.5 E. 42

27. The expression $4n^3 - n^5 + 5n^8$ in standard form would be which of the following?

A. $n^5 + 4n^3 + 5n^8$ B. $-n^5 + 4n^3 + 5n^8$ C. $5n^8 + 4n^3 - n^5$ D. $4n^3 + 5n^8 - n^5$ E. $5n^8 - n^5 + 4n^3$

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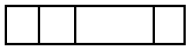
28. How many rectangles can be found in the picture below?



A. 10 B. 9 C. 8 D. 7 E. 6

29. If $A = 2^5 \cdot 3 \cdot 5^8$, then A ends in _____ zeroes.
A. 5 B. 4 C. 3 D. 6 E. 8

30. $(2x - 3)^2$ = _____
A. $4x^2 - 6x + 9$ B. $4x^2 - 12x - 6$ C. $4x^2 - 12x + 9$ D. $4x^2 - 6x + 6$ E. $4x^2 + 9$

31. Jack has a coin collection consisting of quarters and dimes. His total collection is worth $2.90. If Jack has 20 coins total, how many more dimes does he have than quarters?
A. 14 B. 10 C. 6 D. 8 E. 5

32. $x = 7$ is an example of an equation of which kind of line?
A. parallel B. vertical C. perpendicular D. curved E. horizontal

33. Simplify: $3(2a^3b^5)^3$
A. $216a^6b^8$ B. $24a^6b^8$ C. $24a^9b^{15}$ D. $18a^6b^8$ E. $18a^9b^{15}$

34. Which of the following is an example of a Fibonacci sequence?
A. 1, 2, 3, 4, 5, … B. 0, 2, 2, 4, 8, … C. 12, 6, 3, 1½, ¾, … D. 1, 1, 2, 3, 5, … E. 1, 4, 9, 16, 25, …

35. If $f(x) = 3x^2$ and $g(x) = 5x - 3$, find the value of $f(5) - g(7)$.
A. 37 B. 43 C. 21 D. -2 E. 57

36. 40% of 420 = 24% of _____.
A. 1,680 B. 768 C. 700 D. 600 E. 960

37. What is the value of the discriminant of the quadratic equation $11 = 4x^2 - 7x + 14$?
A. -175 B. 1 C. -34 D. -351 E. 100

38. Point A has coordinates (-3, 5) and point B has coordinates (13, 17). Find the distance between A and B.
A. 18 units B. 24 units C. 16 units D. 23 units E. 20 units

39. How much money will be in a bank account if $300.00 was deposited at 4% after 4 years (simple interest)?
A. $384.00 B. $364.00 C. $48.00 D. $348.00 E. $64.00

40. Find the slope of the line with the equation $3x + 6y = -24$.
A. -4 B. -8 C. 2 D. ½ E. -¼

41. Which of the following is not an example of an exponential growth function?
A. $f(x) = 12(1.1)^x$ B. $f(x) = 67(0.99)^x$ C. $f(x) = 7\left(\frac{5}{4}\right)^x$ D. $f(x) = 2(7)^x$ E. $f(x) = 10(1.01)^x$

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42. What is the center of a circle that has a diameter with endpoints (7, -11) and (-1, -13)?

A. (3, -24) B. (8, -12) C. (3, -12) D. (3, 24) E. (8, 12)

43. The short leg of a 30-60-90 right triangle measures 14 inches. What is the length of the long leg?

A. $14\sqrt{2}$ inches B. $28\sqrt{2}$ inches C. 28 inches D. $14\sqrt{3}$ inches E. $7\sqrt{3}$ inches

44. Solve for x: $4\sqrt{x+3} = 24$

A. 397 B. 33 C. 16 D. 3 E. 96

45. Find the sum of the following: $\frac{4}{x} + \frac{3}{2x}$

A. $\frac{11}{2x}$ B. $\frac{7}{2x}$ C. $\frac{11}{2x^2}$ D. $\frac{7x}{2x^2}$ E. $\frac{7}{3x}$

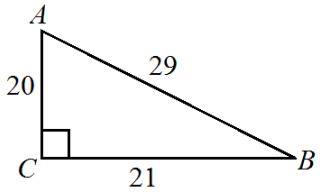
46. The system $\begin{cases} 3x - 2y = 4 \\ y = 5x - 9 \end{cases}$ is classified as which of the following?

A. Consistent & Dependent B. Inconsistent & Dependent C. Consistent & Independent D. Inconsistent & Independent E. Consistent & Inconsistent

47. One side of a triangle is $\frac{1}{3}$ of its perimeter, another side is $\frac{1}{6}$ of its perimeter and the third side is 18 meters. What is the perimeter of the triangle?

A. 42 m B. 36 m C. 32 m D. 48 m E. 46 m

48. What is the sine ratio of $\angle B$?

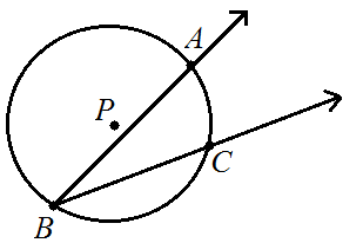


A. $sinB = \frac{21}{20}$ B. $sinB = \frac{21}{29}$ C. $sinB = \frac{20}{21}$ D. $sinB = \frac{29}{21}$ E. $sinB\,\frac{20}{29}$

49. 123_{10} = _____$_9$

A. 142 B. 143 C. 144 D. 145 E. 146

50. Using the picture below, if $m\angle ABC = 38^\circ$, then minor arc AC = ____$^\circ$



A. 38 B. 322 C. 76 D. 52 E. 128

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2014-2015 TMSCA Middle School Mathematics Test #3 Answer Key

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

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2014-2015 TMSCA Middle School Mathematics Test #3 Selected Answers

30. $(2x - 3)^2 = (2x - 3)(2x - 3) = 2x(2x) - 2x(3) - 3(2x) - 3(-3) = 4x^2 - 6x - 6x + 9 = 4x^2 - 12x + 9$

32. $x = 7$ is an example of an equation of a vertical line.

35. If $f(x) = 3x^2$ and $g(x) = 5x - 3$, then the value of $f(5) = 3(5)^2 = 3(25) = 75$ and $g(7) = 5(7) - 3 = 35 - 3 = 32$. Therefore, $f(5) - g(7) = 75 - 32 = 43$.

38. The distance between two given points can be found using the distance formula $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$. Since we are given Point *A* has coordinates (-3, 5) and point *B* has coordinates (13, 17), we substitute and get
$d = \sqrt{(-3 - 13)^2 + (5 - 17)^2} = \sqrt{(-16)^2 + (-12)^2} =$
$\sqrt{256 + 144} = \sqrt{400} = 20$ units.

42. The center of a circle that has a diameter with endpoints (7, -11) and (-1, -13) would be the midpoint of the diameter. So, $\left(\frac{7+(-1)}{2}, \frac{-11+(-13)}{2}\right) = \left(\frac{6}{2}, \frac{-24}{2}\right) = (3, -12)$.

45. To add $\frac{4}{x} + \frac{3}{2x}$, you must have a common denominator, which in this case is $2x$.
$\frac{4}{x} \cdot \frac{2}{2} + \frac{3}{2x} = \frac{8}{2x} + \frac{3}{2x} = \frac{11}{2x}$

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