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 # 5 ©

N O V E M B E R 2 2 , 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 #5

1. 183 – 5,739 = _____

A. -5,556 B. 5,922 C.-5,922 D. -5,596 E. -5,536

2. 14,762 + 9,999 + 1,986 = _____ (nearest thousand)

A. 25,000 B. 26,000 C. 27,000 D. 26,700 E. 25,747

3. $24 \cdot (-54) \cdot (-1) =$ _____

A. -1,296 B. 1,286 C. -1,966 D. -1,348 E. -1,396

4. $-96 \div 0.25 =$ _____ (nearest ten)

A. 360 B. 300 C. 370 D. 380 E. 400

5. 24 is 32% of what number?

A. 64 B. 65 C. 68 D. 75 E. 78

6. If *A*= the median of the set of numbers {12, 11, 9, 12, 4, 5, 5, 10, 16}, find the value of *A* + 14.

A. 13 B. 21 C. 24 D. 25 E. 22

7. The diameter of a circle is 18 inches. In terms of π, what is the circumference of the circle?

A. 18π in.^{2} B. 36π in. C. 324π in.^{2} D. 9π in. E. 18π in.

8. At school on Fridays, students are allowed to wear their favorite college jerseys. Last Friday, 3 out of 5 students wore a college jersey. If there are 640 students in the school, how many wore college jerseys last Friday?

A. 384 B. 424 C. 256 D. 368 E. 408

9. Which symbol below is used for approximation? For example, π is approximately 3.14, which symbol below could be used in place of the word approximately?

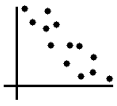
A. = B. ≠ C. ~ D. ≅ E. ≈

10. 2.5 miles = _____ feet

A. 13,200 B. 4,400 C. 8,800 D. 16,480 E. 5,280

11. If a ¥ $b = 3a^2 - b + ab$, then find the value of -2 ¥ 5.

A. 7 B. -3 C. -51 D. -31 E. -27



12. The scatter plot to the right displays which type of correlation?

A. positive B. negative C. no correlation D. accelerated E. disbursed

13. If $\Delta ABC \sim \Delta XYZ$, then $\overline{AC}$ is proportional to which of the following?

A. $\overline{AC}$ B. $\overline{YZ}$ C. $\overline{XY}$ D. $\overline{XZ}$ E. $\overline{BC}$

14. What is the sum of the next three terms of the sequence 11, 17, 23, 29, …?

A. 67,445 B. 35 C. 35, 41, 46 D. 122 E. 123

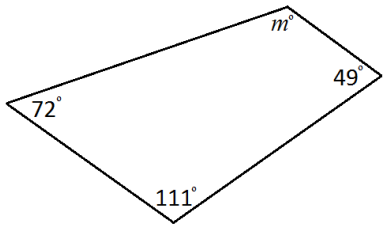
15. A coin is flipped and a number cube is rolled. What is the probability of getting a heads on the coin and a number greater than 2 on the number cube (in ratio form)?

A. 2:3 B. 1:2 C. 1:3 D. 1:4 E. 2:5

16. ΔABC is a right triangle, with $\angle B = 90^\circ$, $\overline{AB} = 9$ and $\overline{AC} = 15$. What is the perimeter of ΔABC?

A. 24 units B. 33 units C. 36 units D. 39 units E. 54 units

17. Using the picture below, the measure of $\angle m$ is equal to _____$^\circ$.



A. 96 B. 218 C. 156 D. 98 E. 128

18. The Least Common Multiple of the numbers 18 and 24 is ten more than which of the following numbers?

A. 82 B. 62 C. 72 D. 42 E. 48

19. *XIX* + *VII* = _____ (Arabic number)

A. 9 B. 7 C. 28 D. 26 E. 23

20. Simplify: $(4x - 5y + 3) - (2x - 5y + 1)$

A. $2x - 10y + 4$ B. $2x - 10y + 2$ C. $2x + 2$ D. $2x - y - 2$ E. $2x - 10y$

21. \$42.76 = 120 quarters + _____ dimes + 35 nickels + 11 pennies

A. 109 B. 121 C. 87 D. 270 E. 93

22. What are the values of the 1st quartile and 3rd quartile of the data set 34, 42, 44, 46, 52, 12 and 60?

A. Q1 = 42; Q3 = 46 B. Q1 = 38; Q3 = 49 C. Q1 = 34; Q3 = 52 D. Q1 = 12; Q3 = 42 E. Q1 = 34; Q3 = 46

23. The point (4, -2) is translated four units up and seven units to the left. In which quadrant does the point now lie in?

A. Quadrant I B. Quadrant II C. Quadrant III D. Quadrant IV E. Quadrant V

24. A cell with a diameter of 0.00000056 mm is doubled in size. What is the length of the new diameter of the cell?

A. 5.6×10^{-7}mm B. 5.6×10^{7}mm C. 1.12×10^{-6}mm D. 1.12×10^{-8}mm E. 5.6×10^{-6}mm

25. If six ice-creams cost \$8.50, how much would two dozen ice-creams cost?

A. \$34.00 B. \$17.00 C. \$204.00 D. \$25.50 E. \$68.00

26. ΔABC has angle measures $35^\circ, 68^\circ$ and x°, respectively. What is the complement of $\angle C$?

A. 13° B. 103° C. 77° D. 73° E. 22°

27. Laura wants to make bracelets using a piece of yarn that is five feet long. If the bracelets she wants to make will only be eight inches long, how much yarn will be left after she cuts as many of the lengths as possible?

A. ½ foot B. 6 inches C. 4 inches D. ¼ foot E. 2 inches

28. Which shape below can be broken into exactly six equilateral triangles?

A. square B. rectangle C. hexagon D. octagon E. dodecagon

29. If 16 wigwags is reduced to 10 wigwags, what was the percent decrease?

A. 56.25% B. 37.5% C. 42.5% D. 60% E. 31.25%

30. 21 quarts = _____ cups

A. 5.25 B. 5.5 C. 42 D. 84 E. 168

31. Which linear equation below is written in the form of a direct variation?

A. $y = 4x + 5$ B. $y - 2 = 3(x + 7)$ C. $4x + 5y = 11$ D. $y + \frac{3}{4} = x - 3$ E. $y = \frac{1}{4}x$

32. If $(3x + 1)(2x + 3) = 6x^2 + Bx + 3$, then find the value of $5B$.

A. 7 B. 35 C. 11 D. 90 E. 55

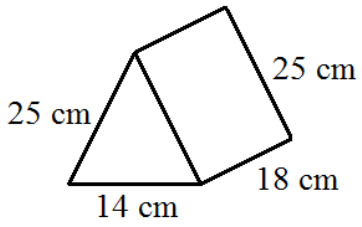
33. 1211_3 = _____$_5$

A. 49 B. 43 C. 144 D. 201 E. 141

34. B is the midpoint of $\overline{AC}$. If A has coordinates (2, 5) and B has coordinates (22, 6), what are the coordinates of C?

A. (12, 5.5) B. (32, 6.5) C. (32, 7) D. (42, 7) E. (42, 1)

35. What is the lateral surface area of the triangular prism below?



A. 1,152 cm^2 B. 1,488 cm^2 C. 1,184 cm^2 D. 1,336 cm^2 E. 1,272 cm^2

36. If $g(x) = 11 + \frac{1}{2}x$, find the value of $3g(-52)$.

A. -30 B. -15 C. 312 D. -45 E. - 35

37. In five minutes, the minute hand on a clock turns _____ degrees?

A. 30 B. 15 C. 10 D. 45 E. 5

38. What is the sum of the positive factors of the number 24?

A. 45 B. 46 C. 60 D. 59 E. 64

39. Shahman wants to buy a shirt that costs $15.53. What will Shahman's total cost be if there is a 6% tax?
A. $15.87 B. $16.36 C. $16.46 D. $16.53 E. $17.07

40. How much simple interest will Reagan receive if she were to deposit $500 at 3.2% for 7 years?
A. $112 B. $110 C. $114 D. $612 E. $116

41. What is the growth rate in the exponential growth function $f(x) = 4(3.4)^x$?
A. 3.4% B. 340% C. 434% D. 240% E. 40%

42. $47^{\frac{2}{3}}$ is equivalent to $\sqrt[3]{47^2}$ or which of the following?
A. $\left(\sqrt[3]{47}\right)^2$ B. $47^{1.5}$ C. $\left(\sqrt{47^3}\right)^2$ D. $\left(\sqrt{47^2}\right)^3$ E. $\left(\sqrt[2]{47}\right)^3$

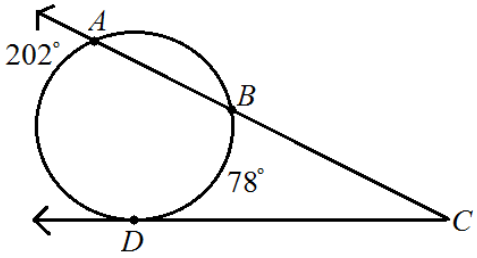
43. What is the 51st term of the sequence -11, -7, -3, 1, 5, …?
A. 189 B. 201 C. 193 D. 205 E. 62

44. At a firefighter banquet, adult tickets were $5.00 and child tickets were $3.50. If tickets sales totaled $1,140.00 with 240 people attending the banquet, how many more adults attended than children?
A. 180 B. 75 C. 90 D. 110 E. 160

45. What are the coordinates of the vertex of the quadratic equation $6 = 3x^2 - 6x + 11$?
A. (0, 5) B. (-1, 14) C. (6, 77) D. (1, 2) E. (2, 5)

46. The diameter of a circle that has a center located at (4, 5) and the point (8, 8) lies on the circle is ____ units.
A. 5 B. 10 C. 9 D. 16 E. 25

47. In the picture below, arc AD $= 202^\circ$ and arc BD $= 78^\circ$. The measure of $\angle ACD =$ ____$^\circ$.



A. 28 B. 48 C. 62 D. 74 E. 39

48. Calculate the mean absolute deviation for the set of data 66, 56, 54, 52 and 52.
A. 56 B. 4 C. 4.4 D. 11.2 E. 54

49. How many zeroes are there in the solution to $4^6 \cdot 5^4 \cdot 7^2 \cdot 11$?
A. 2 B. 4 C. 6 D. 8 E. 10

50. What is the 11th triangular number?
A. 66 B. 56 C. 55 D. 78 E. 82

2014-2015 TMSCA Middle School Mathematics Test #5 Answer Key

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

2014-2015 TMSCA Middle School Mathematics Test #5 Selected Answers

11. If $a ¥ b = 3a^2 - b + ab$, then $-2 ¥ 5 = 3(-2)^2 - 5 + (-2)(5) = 3(4) - 5 - 10 = 12 - 5 - 10 = -3$.

17. The picture given is a quadrilateral, which using the formula $180(n - 2)$, where n equals the number of sides of the polygon, we know that $180(4-2) = 360^\circ$. Thus, we must subtract the angle measures given from 360 and $360 - 49 - 72 - 111 = 128$. Therefore, $\angle m = 128^\circ$.

20. $(4x - 5y + 3) - (2x - 5y + 1) = 4x - 5y + 3 - 2x + 5y - 1 = 2x + 2$.

29. To find percent of change, use $\frac{change\ in\ amount}{original\ amount} \cdot 100 = \%$. If we have 16 wigwags and it changes to 10 wigwags, then $\frac{16-10}{16} = \frac{6}{16} = \frac{3}{8} = 0.375 \cdot 100 = 37.5\%$.

41. To find the growth rate in the exponential growth function $f(x) = 4(3.4)^x$, first, subtract 1 from the growth factor. $3.4 - 1 = 2.4$. Now, change 2.4 to a percentage and 2.4 = 240%, which is the growth rate.

48. The mean absolute deviation of a set of data is the average distance between each data value and the mean. We are given the values 66, 56, 54, 52 and 52. First we need the mean of these five numbers, which is $\frac{66+56+54+52+52}{5} = 56$. Now we need to find the differences from each value to the mean, and we will get $66 - 56 = 10$, $56 - 56 = 0$, $54 - 56 = -2$, $52 - 56 = -4$, and $52 - 56 = -4$. Now we take the absolute value of each of these values and find the mean of them, which is $\frac{10+0+2+4+4}{5} = 4$. Therefore, the mean absolute deviation of the set of numbers 66, 56, 54, 52 and 52 is 4.