8

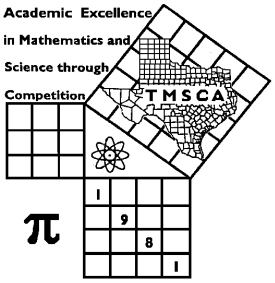
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

Grade: 4 5 6 7 8 Classification: 1A 2A 3A 4A 5A 6A



TMSCA MIDDLE SCHOOL CALCULATOR TEST #8 ©

JANUARY 25, 2020

GENERAL DIRECTIONS

I. About this test:
- A. You will be given 30 minutes to take this test. There are 80 problems on this test.
- **B. ALL calculators must be cleared. HP Prime and Casio Prizm calculators are NOT permitted.**

II. How to write the answers:
- A. For all problems except stated problem as noted below write three significant digits.
  1. Examples (* means correct, but not recommended)
     Correct: 12.3, 123, 123.*, 1.23x10*, $1.23x10^{0}$*, $1.23x10^{1}$, $1.23x10^{01}$, .0190, $1.90x10^{-2}$
     Incorrect: 12.30, 123.0, $1.23(10)^{2}$, $1.23\cdot10^{2}$, $1.230x10^{2}$, $1.23*10^{2}$, 0.19, $1.9x10^{-2}$, $19.0x10^{-3}$, 1.90E-02
  2. Plus or minus one digit error in the third significant digit is permitted.
- B. For stated problems:
  1. Except for integer, dollar sign, and significant digit problems, as detailed below, answers to stated problems should be written with three significant digits.
  2. Integer problems are indicated by (integer) in the answer blank. Integer problems answers must be exact, no plus or minus one digit, no decimal point or scientific notation.
  3. Dollar sign ($) problems should be answered to the exact cent, but plus or minus one cent error is permitted. The decimal point and cents are required for exact dollar answers.

III. Some symbols used on the test.
- A. Angle measure: rad means radians; deg means degrees.
- B. Inverse trigonometric functions: arcsin for inverse sine, etc.
- C. Special numbers: π for 3.14159 . . . ; e for 2.71828.
- D. Logarithms: Log means common (base 10); Ln means natural (base e).

IV. Scoring:
- A. All problems answered correctly are worth FIVE points. FOUR points will be deducted for all problems answered incorrectly or skipped before the last problem attempted.

2019-2020 TMSCA Middle School Calculator Test #8

1. 1780 – 344 ---------- 1=_____

2. 61 – 15 + 66 ---------- 2=_____

3. –2170 + 223 – 1880 ---------- 3=_____

4. 51 – 28 + 18 – 69 ---------- 4=_____

5. 2770 – 4350 – 2900 + 4240 ---------- 5=_____

6. 90.9 + 170 – 79.9 – 130 + 97.2 ---------- 6=_____

7. (0.804 + 0.698 – 0.523) – (1.69 + 1.3) ---------- 7=_____

8. (π – 0.354) + (0.516 – 0.944 – 0.315) ---------- 8=_____

9. 26 x 346 x 311 ---------- 9=_____

10. 250 x 1500 x 1940 x 192 ---------- 10=_____

11. Terry completed seven-eighths of his TMSCA calculator test in order starting with number one. He missed one-seventh of the problems worked. Calculate his score. ---------- 11=_____INT.

12. Tanya purchased four BBQ sandwiches at $3.25 each, two orders of fries at $1.59 each and two large drinks at $1.99 each. Calculate the cost of meal. ---------- 12=$_____

13. Calculate the volume of a box that measures 25 cm by 34 cm by 52 cm. ---------- 13=_____cm^3

14. $(717)[139 \times 704 \times 588]$ ---------- 14=_____

15. $(-97/65)[15 - 70]$ ---------- 15=_____

16. $\{83/734\}\left[\frac{535}{426 + 500}\right]$ ---------- 16=_____

17. $\left[\frac{295}{351}\right][(383/239) + 1.55]$ ---------- 17=_____

18. $\left[\frac{(2250/1550) - (909/1700)}{15.9/(25.9)}\right]$ ---------- 18=_____

19. $\frac{[0.00914/(0.00685)]/0.198}{(47.3 \times 39.8)(0.0139)}$ ---------- 19=_____

20. $\frac{(62.4)(0.617)}{0.00148}(0.455 - 0.579)$ ---------- 20=_____

21. $\frac{99.7 + 58.7 + 34}{(6.08 \times 10^{-5})(4.83)(1570)}$ ---------- 21=_____

22. $\frac{[-(962 + 1950)(927 - 1690)]}{(60.3/(45300))}$ ---------- 22=_____

23. $\frac{(219 \times 514)/391}{(129 \times 1060) + 89600}$ ---------- 23=_____

24. Calculate the number of miles in one million inches. ---------- 24=_____mi.

25. An 8 foot board is cut into two pieces. One piece is 8 inches longer than the other. Calculate the length of the shorter piece. - 25=_____in.

26. In a 30-60-90 right triangle the hypotenuse measures 52.8 cm. Calculate the measure of the side opposite the 60° angle in cm. - 26=_____cm

27. $(14.6)[(0.0332/0.0496)(0.00237 + 0.00227)]$ ---------- 27=_____

28. $\dfrac{(0.545 - 1.52)(0.749 + 0.536)}{(9.61\text{x}10^{11})}$ ---------- 28=_____

29. $[2840 - (3350 + 783)] + [(0.441)(4070 - 6140)]$ ------- 29=_____

30. $\dfrac{1}{115} + \dfrac{1}{(\pi)(106 - 64)}$ ---------- 30=_____

31. $\dfrac{(2.76 + 1.59)}{(7.41\text{x}10^{10})}$ ---------- 31=_____

32. $(20.5)\left[(2.12\text{x}10^{12}) - (1.70\text{x}10^{12})\right]$ ---------- 32=_____

33. $\dfrac{1}{545} - \dfrac{1}{(422 + 171)}$ ---------- 33=_____

34. $1/(0.00367 - 0.00853) - 1/(-9.49\text{x}10^{-4})$ ---------- 34=_____

35. Calculate π^{2358}. ---------- 35=_____

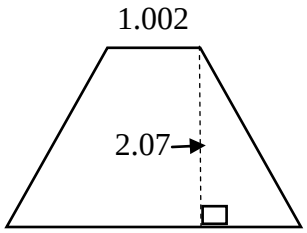
36. Jason ran 900 meters in 8 minutes and 34 seconds. Calculate his speed in miles per hour. ---------- 36=_____mph

RECTANGLE

Area = $1.53\text{x}10^{-3}$
Length = ?

37=_____

TRAPEZOID



Area = 5.39
Bottom Base = ?

38=_____

39. $\sqrt{\frac{0.265 + 0.382}{588 - 553}}$ ---------- 39=_____

40. $(0.597 + 0.896)^2(113 + 162)^2$ ---------- 40=_____

41. $\left[\frac{44.3}{235}\right](979 + 229)^2$ ---------- 41=_____

42. $(1/\pi)\sqrt[3]{\frac{1.34 + 0.809}{0.0638 - 0.0226}}$ ---------- 42=_____

43. $(4150)\sqrt{342 + 3170 + 1780}$ ---------- 43=_____

44. $\sqrt{19.6} + \sqrt{17.6 + 20.5} - (\pi)\sqrt{17.7}$ ---------- 44=_____

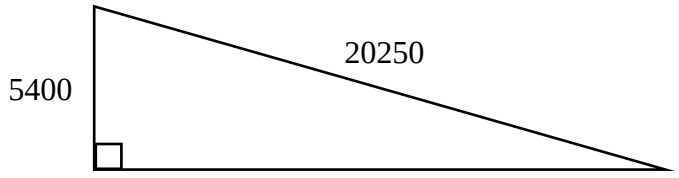
45. $\frac{1}{\sqrt{807 + 1000 + 1160}} + \left(\frac{1}{\sqrt{5.93}}\right)^4$ ---------- 45=_____

46. $\left[\sqrt{(312/523)(415)}\right]^3$ ---------- 46=_____

47. Calculate the number of distinct diagonals in a polygon with two hundred twenty-two sides. ---------- 47=_____INT.

48. Pressure varies inversely as the volume according to Boyle's Law. When the pressure is 250 pascals, the volume is 32 liters. Calculate the volume if the pressure is reduced to 170 pascals. - 48=_____l

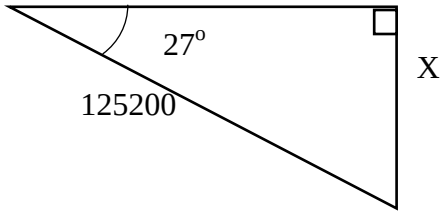
RIGHT TRIANGLE



Area = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{709 - 691 + \sqrt{2.87x10^5/1750}}{-88.9 + 263}\right]^{-4}$ ---------- 51=_____

52. $\frac{(0.027 + 0.0362 - 0.00528)^4}{\sqrt{9.19 + 1.81 + 4.69}}$ ---------- 52=_____

53. $\left[\frac{15800 + 23000 + \sqrt{1.41x10^9 + 6.47x10^8}}{5.21/33.2}\right]^4$ ---------- 53=_____

54. $0.599 + \sqrt{(1230)/(439)} - (0.475 + 0.193)^2$ ---------- 54=_____

55. $\sqrt{\frac{(5010)(18500)}{(40000)(23500)}} - 0.0589 + 0.0997$ ---------- 55=_____

56. $428 + \sqrt{(1130)(685)} - (720 + 568)$ ---------- 56=_____

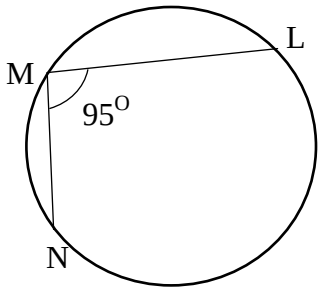
57. $\sqrt{\frac{1/(149 - 66.9)}{(175)(30.6 + 12.3)^{-2}}}$ ---------- 57=_____

58. $\sqrt{\frac{(1430)(120)}{(7.28) + (4.33)}} + 1/(0.383)^5$ ---------- 58=_____

59. A water holding tank holds 52,000 gallons when 100% full. Calculate the number of gallons the tank is holding at 32% full. ---------- 59=_____gal.

60. Calculate the odds of rolling a sum of 8 on a standard pair of dice. ---------- 60=_____

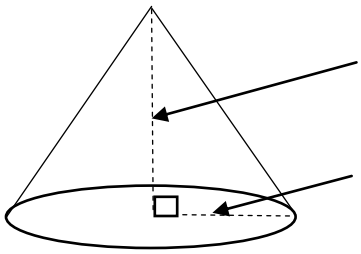
CIRCLE AND INSCRIBED ANGLE



Arc ML = 75°
Arc MN = ?

61=_____°

CONE



Volume = 9880

x = ?

62=_____

63. $\frac{17!/22!}{21! + 24!}$ ---------- 63=_____

64. (deg) (26 – 18.1)tan(16.8°) ---------- 64=_____

65. $(46.3 - \pi)e^{0.568}$ ---------- 65=_____

66. (deg) (135 – 168)sin(99.6°) + 26 ---------- 66=_____

67. (deg) cos(3.01° – 1.5°) + 0.443 ---------- 67=_____

68. (rad) (3.09)cos(8.21) ---------- 68=_____

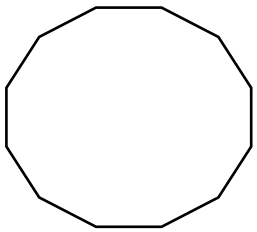
69. (deg) $\frac{\sin(500)}{\tan(500)}[160]$ ---------- 69=_____

70. $\left[(18.8)\left(\frac{4550}{(3430)(\pi)}\right)\right]^{7/2}$ ---------- 70=_____

71. A right cylindrical tank has a diameter of 52 feet. The tank is 82 feet tall. Calculate the number of gallons this tank will hold. ---- 71=_____gal.

72. The car dealership sold the base edition of a car for $15,000 and the luxury edition for $22,000. If the total sales for the first quarter was $1,944,000 and 26 more base vehicles than luxury editions, calculate the total number of cars sold. ---------- 72=_____INT.

REGULAR DODECAGON

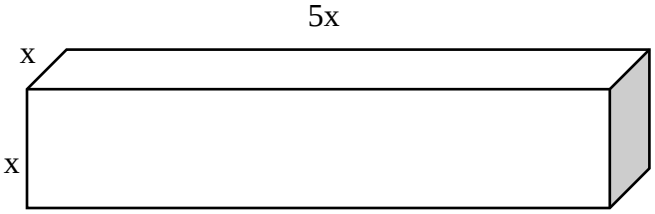


Perimeter = 578100

Area = ?

73=_____

RIGHT RECTANGULAR PRISM



Surface Area = 9213000 x = ?

74=_____

75. $\dfrac{\text{Log}(1.31 + \pi)}{13200 - 14800}$ ---------- 75=_____

76. $\dfrac{(33.5)^{0.976}(15.3)^{0.318}}{(25.3 - 9.04)^{-5}}$ ---------- 76=_____

77. $\text{Log}\sqrt{\dfrac{10.4 - 10.1}{(13.1)(0.835)}}$ ---------- 77=_____

78. $\dfrac{\text{Log}[3.45 + (2.62)(1.45)]}{0.072 + \text{Log}[0.929 + 0.698]}$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 724$ ---------- 79=_____

80. $1 + 0.219 + (0.219)^2 + \dfrac{(0.219)^4}{8} - \dfrac{(0.219)^5}{15}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #8 Answer Key

Page 1

1 = 1440
= 1.44×10^{3}

2 = 112
= 1.12×10^{2}

3 = -3830
= -3.83×10^{3}

4 = -28.0
= -2.80×10^{1}

5 = -240
= -2.40×10^{2}

6 = 148
= 1.48×10^{2}

7 = -2.01
= -2.01×10^{0}

8 = 2.04
= 2.04×10^{0}

9 = 2.80×10^{6}

10 = 1.40×10^{11}

11 = 260 INT.

12 = $20.16

13 = 44200
= 4.42×10^{4}

Page 2

14 = 4.13×10^{10}

15 = 82.1
= 8.21×10^{1}

16 = 0.0653
= 6.53×10^{-2}

17 = 2.65
= 2.65×10^{0}

18 = 1.49
= 1.49×10^{0}

19 = 0.258
= 2.58×10^{-1}

20 = -3230
= -3.23×10^{3}

21 = 417
= 4.17×10^{2}

22 = 1.67×10^{9}

23 = 0.00127
= 1.27×10^{-3}

24 = 15.8
= 1.58×10^{1}

25 = 44.0
= 4.40×10^{1}

26 = 45.7
= 4.57×10^{1}

Page 3

27 = 0.0453
= 4.53×10^{-2}

28 = -1.30×10^{-12}

29 = -2210
= -2.21×10^{3}

30 = 0.0163
= 1.63×10^{-2}

31 = 5.87×10^{-11}

32 = 8.61×10^{12}

33 = 0.000149
= 1.49×10^{-4}

34 = 848
= 8.48×10^{2}

35 = 1.90×10^{1172}

36 = 3.92
= 3.92×10^{0}

37 = 0.0529
= 5.29×10^{-2}

38 = 4.21
= 4.21×10^{0}

Page 4

39 = 0.136
= 1.36×10^{-1}

40 = 169000
= 1.69×10^{5}

41 = 275000
= 2.75×10^{5}

42 = 1.19
= 1.19×10^{0}

43 = 302000
= 3.02×10^{5}

44 = -2.62
= -2.62×10^{0}

45 = 0.0468
= 4.68×10^{-2}

46 = 3900
= 3.90×10^{3}

47 = 24309 INT.

48 = 47.1
= 4.71×10^{1}

49 = 5.27×10^{7}

50 = 56800
= 5.68×10^{4}

2019-2020 TMSCA Middle School Calculator Test #8 Answer Key

Page 5

51 = 1020
$= 1.02 \times 10^{3}$

52 = 2.84×10^{-6}

53 = 8.27×10^{22}

54 = 1.83
$= 1.83 \times 10^{0}$

55 = 0.355
$= 3.55 \times 10^{-1}$

56 = 19.8
$= 1.98 \times 10^{1}$

57 = 0.358
$= 3.58 \times 10^{-1}$

58 = 243
$= 2.43 \times 10^{2}$

59 = 16600
$= 1.66 \times 10^{4}$

60 = 0.161
$= 1.61 \times 10^{-1}$

Page 6

61 = 95.0
$= 9.50 \times 10^{1}$

62 = 5.61
$= 5.61 \times 10^{0}$

63 = 5.10×10^{-31}

64 = 2.39
$= 2.39 \times 10^{0}$

65 = 76.2
$= 7.62 \times 10^{1}$

66 = -6.54
$= -6.54 \times 10^{0}$

67 = 1.44
$= 1.44 \times 10^{0}$

68 = -1.08
$= -1.08 \times 10^{0}$

69 = -123
$= -1.23 \times 10^{2}$

70 = 1410
$= 1.41 \times 10^{3}$

71 = 1.30×10^{6}

72 = 110 INT.

Page 7

73 = 2.60×10^{10}

74 = 647
$= 6.47 \times 10^{2}$

75 = -0.000405
$= -4.05 \times 10^{-4}$

76 = 8.33×10^{7}

77 = -0.781
$= -7.81 \times 10^{-1}$

78 = 3.04
$= 3.04 \times 10^{0}$

79 = 131000
$= 1.31 \times 10^{5}$

80 = 1.27
$= 1.27 \times 10^{0}$

TMSCA 19-20 MS CA Test #8 Solutions to Word and Geometry Problems

11. 70 questions answered, 10 missed $70(5) - 10(9)$

12. 4(3.25) + 2(1.59) + 2(1.99)

13. 25 x 34 x 52

24. 1,000,000 ÷ 12 ÷ 5280

25. x = short piece
x + 8 = longer piece
$$x + x + 8 = 8(12)$$
Solve for x.

26. $\frac{52.8}{2}(\sqrt{3})$

35. π^{2358}.
2358 [ENTER] π [log] [x] [SHOW] *(Look at the digits to the left of the decimal. This gives 1172 for the exponent. Write down 10^{1172}.) Then punch*
1172 [−] [10^x]
(This gives 1.90 E0 which is the first part of your answer.
The answer is **1.90 x10^{1172}**). *This is done on the HP RPN calculator.*

36.
$$\frac{900\ meters}{8\frac{34}{60}\ min} \cdot \frac{1\ km}{1000\ m} \cdot \frac{1\ mile}{1.61\ km} \cdot \frac{60\ min}{1\ hr}$$

37. $\frac{1.53\ x\ 10^{-3}}{.0289}$

38. $\frac{(1.002+x)2.07}{2} = 5.39$
$$x = \frac{5.39(2)}{2.07} - 1.002$$

47.
diagonals $\frac{n(n-3)}{2} = \frac{222(219)}{2}$

48. $250(32) = 170x$
$$x = \frac{250(32)}{170}$$

49. $\frac{\left(\sqrt{20250^2-5400^2}\right)(5400)}{2}$

50. $\frac{sin(27)}{1} = \frac{x}{125200}$
$$x = 125200(sin\ 27)$$

59. $\frac{52000}{100} = \frac{x}{32}$
$$x = \frac{52000(32)}{100}$$

60. $\frac{5}{36-5}$

61. Major arc NL = $95(2)$.
360 degrees in complete circle.
Arc MN = $360 - 75 - 95(2)$

62. V = $\frac{1}{3}\pi r^2 h$
$$9880 = \frac{1}{3}\pi(3.18x)^2(5.28x)$$
$$\frac{9880(3)}{\pi} = (3.18x)^2(5.28x)$$
$$\frac{9880(3)}{\pi(3.18)^2(5.28)} = x^3$$
$$\sqrt[3]{\frac{9880(3)}{\pi(3.18)^2(5.28)}} = x$$

71. Get volume in cubic inches since 231 in^3 = 1 gallon
Radius = 26 x 12 inches = 312
Height = 82 x 12 inches = 984
V = $\pi r^2 h = \pi(312)^2(984)$
Divide this by 231.

72. x= luxury editions sold
$x + 26$ = base editions sold
$$15000(x + 26) + 22000x = 1944000$$
Solve for x. x = 42 so x + 26 = 68.
Total number of cars = 42 + 68.

73. Area of any regular polygon can be found using:
$$\frac{perimeter^2}{\left(tan\frac{180}{n}\right)(4n)}$$
$$\frac{(578100)^2}{\left(tan\frac{180}{12}\right)(4x12)}$$

74.
$$2x^2 + 2(5x^2) + 2(5x^2) = 9213000$$
$$22x^2 = 9213000$$
$$x = \sqrt{\frac{9213000}{22}}$$