

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

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 #9 ©

FEBRUARY 1, 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*, 1.23x10⁰*, 1.23x10¹, 1.23x10⁰¹, .0190, 1.90x10⁻²
 Incorrect: 12.30, 123.0, 1.23(10)², 1.23·10², 1.230x10², 1.23*10², 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.

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2019-2020 TMSCA Middle School Calculator Test #9

1. $177 - 1060$ ----- 1=_____

2. $26 + 25 - 35$ ----- 2=_____

3. $101 - 148 + 368$ ----- 3=_____

4. $\pi - 6 + 7 - 7$ ----- 4=_____

5. $134 + 174 - 122 - 248$ ----- 5=_____

6. $261 + 72.4 - 85.2 - 128 - 260$ ----- 6=_____

7. $5.67 + 4.57 + 2.94 + 2.93 + 3.41$ ----- 7=_____

8. $0.882 + 1.6 - \pi + 1.15 + 1.25$ ----- 8=_____

9. $688 \times 78.7 \times 274$ ----- 9=_____

10. $2490 \times 80.8 \times 82.7 \times 3660$ ----- 10=_____

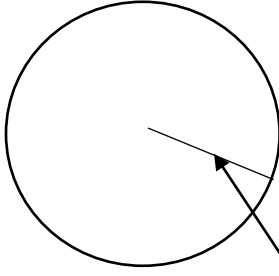
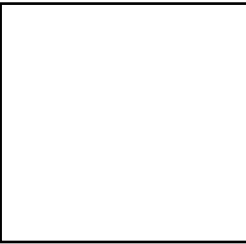
11. The perimeter of a rectangle is 274 cm. If the length is 81 cm,
calculate the width. ----- 11=_____cm

12. The vertices of a right triangle have the coordinates (0,0); (6,0);
and (6,12). Calculate the area in square units. ----- 12=_____units²

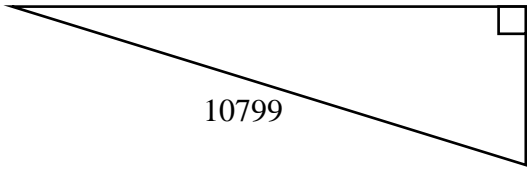
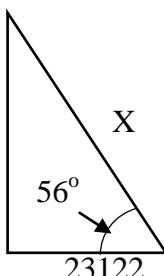
13. Calculate the equivalence of $3\pi/7$ radians in degrees. ----- 13=_____°

14. $(-31)[184 \times 73 \times 82]$ ----- 14=_____
15. $(-187)[75 \times 274/108]$ ----- 15=_____
16. $\left[\frac{188}{305}\right][(342/385) - 0.582]$ ----- 16=_____
17. $(38 + 97)[187 - 243 - 171]$ ----- 17=_____
18. $\frac{[0.0187/(0.129)]/109}{(7.79 \times 11.7)(0.377)}$ ----- 18=_____
19. $\left[\frac{(22.2 + 21.3)}{240/186}\right]\left[\frac{0.154}{0.0207}\right]$ ----- 19=_____
20. $\frac{0.00113 + 7.16 \times 10^{-4} + 0.00185}{(96.5)(121)(961)}$ ----- 20=_____
21. $(9.14)[143/47 \times 14/122] - 2.45$ ----- 21=_____
22. $\frac{[-(613 + 3710)(1420 - 695)]}{(7.95/(3200))}$ ----- 22=_____
23. $\frac{(\pi)(98/74)(16/104)}{(106/24)}$ ----- 23=_____
24. The sum of four consecutive odd integers is 976. Calculate the value of the largest integer. ----- 24=_____INT.
25. In a 30-60-90 triangle, the hypotenuse measures 12020 ft. Calculate the measure of the shortest side. ----- 25=_____ft.
26. An angle and twice its complement have a sum of 124. Calculate the angle's complement. ----- 26=_____°

27. $[2400 - (1650 + 6140)] + [(-3.17)(4010 - 2830)]$ ----- 27=_____
28. $\frac{(284 - 803)(21.5 + 18.9)}{(8.37 \times 10^{11})}$ ----- 28=_____
29. $(0.379)[[0.0136/(0.00932)][262/(144)]]$ ----- 29=_____
30. $\frac{1}{-0.111} + \frac{1}{(\pi)(0.0382 - 0.0879)}$ ----- 30=_____
31. $\frac{1}{0.022} + \frac{1}{(0.00919 - 0.00158)}$ ----- 31=_____
32. $(0.0836)\left[\frac{117}{(8.46 \times 10^{-12})}\right]$ ----- 32=_____
33. $\frac{1}{105} - \frac{1}{315} + \frac{1}{542}$ ----- 33=_____
34. $\frac{1}{149} - \frac{1}{(153 + 148)}$ ----- 34=_____
35. Calculate the additive inverse of the reciprocal of e to the twenty-fifth power. ----- 35=_____
36. Two motorcycles leave the same spot in DFW at 12:30 pm. One travels north at 70 mph and the other east at 62 mph. Calculate how far they will be apart at 2:45 pm. ----- 36=_____mi.

CIRCLE	SQUARE
 <p style="margin-left: 100px;">Circumference = 0.0021</p> <p style="margin-left: 100px;">Radius = ?</p>	 <p style="margin-left: 50px;">Area = 270000</p> <p style="margin-left: 50px;">Perimeter = ?</p>
37=_____	38=_____

39. $\left[\frac{3590 + (1/(4.04 \times 10^{-4}))}{(9190/7890) - 0.617} \right]^2$ ----- 39=_____
40. $\frac{(47600 + 13500)^3}{(0.125 - 0.354)^2}$ ----- 40=_____
41. $\left[\frac{749}{1300} \right] (19 + 17.8)^3$ ----- 41=_____
42. $(2270)\sqrt{165 + 305 + 89}$ ----- 42=_____
43. $\sqrt{806 - 801 + 138} - \sqrt{259}$ ----- 43=_____
44. $(1/\pi)\sqrt[3]{\frac{4.54 + 2.37}{0.23 - 0.143}}$ ----- 44=_____
45. $\frac{1}{\sqrt{128 + 220 + 66}} + \left(\frac{1}{\sqrt{14.2}} \right)^2$ ----- 45=_____
46. $(43400)\sqrt[3]{14400 + 22700 - 4840}$ ----- 46=_____
47. Calculate the sum of the measures of the exterior angles of a dodecagon. ----- 47=_____°
48. A truck tire has an outside diameter of 28.5 inches. Calculate the number of miles the tire will travel in 10,000 revolutions. ---- 48=_____mi.

RIGHT TRIANGLE	RIGHT TRIANGLE
 <p style="margin-top: 10px;">Perimeter = ?</p>	 <p style="margin-top: 10px;">X = ?</p>
49=_____	50=_____

51. $\sqrt{\frac{291}{(2.4)(0.00428)} + \frac{(6270 - 6580)}{(0.426 + 0.312)}} \dots\dots\dots 51 = \underline{\hspace{2cm}}$

52. $\frac{\sqrt{66.8 + \pi + 46.4}}{(23100 - 29200 + 30400)^2} \dots\dots\dots 52 = \underline{\hspace{2cm}}$

53. $\frac{(0.00681 + 0.0118 - 0.00171)^4}{\sqrt{0.25 + 0.196 + 0.306}} \dots\dots\dots 53 = \underline{\hspace{2cm}}$

54. $44300 + \sqrt{(27300)(13300)} - (11500 + 6740) \dots\dots\dots 54 = \underline{\hspace{2cm}}$

55. $\sqrt{\frac{(32200)(7360)}{(6830)(15200)}} - 1.19 + 0.18 \dots\dots\dots 55 = \underline{\hspace{2cm}}$

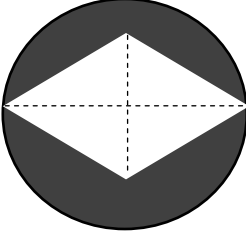

56. $\sqrt{\frac{1/(32.8 - 14.7)}{(37)(23.5 + 55.5)^3}} \dots\dots\dots 56 = \underline{\hspace{2cm}}$

57. $\sqrt{\frac{1/(225 - 142)}{(1260)(129 + 39.8)^6}} \dots\dots\dots 57 = \underline{\hspace{2cm}}$

58. $\sqrt{\frac{(58.4)(20.6)}{(61.5) + (129)}} - 2.7 \dots\dots\dots 58 = \underline{\hspace{2cm}}$

59. Calculate the area of a regular pentagon with a side length of 230 inches and an apothem of 158.284 inches. $\dots\dots\dots 59 = \underline{\hspace{2cm}} \text{ in.}^2$

60. Calculate the probability of rolling a sum less than 5 on a standard pair of dice. $\dots\dots\dots 60 = \underline{\hspace{2cm}}$

RHOMBUS AND CIRCLE	CYLINDER
<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  </div> <div> <p>Major axis = 22.7 Minor axis = 12.9</p> <p>Shaded Area = ?</p> </div> </div> <p>61=_____</p>	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  </div> <div> <p>Lateral Surface Area = 289.6 Radius = 18.7</p> <p>Volume = ?</p> </div> </div> <p>62=_____</p>

63. $\frac{9! - 8!}{18!}$ ----- 63=_____

64. (deg) $(24800 + 43700)\tan(182^\circ)$ ----- 64=_____

65. $(1.58 \times 10^5 - 3.70 \times 10^5)^7 (2.74 \times 10^5)$ ----- 65=_____

66. (deg) $\tan(62.1^\circ - 35.4^\circ) + 0.0935$ ----- 66=_____

67. (deg) $[14.3]\tan(16.5^\circ - 25.3^\circ)$ ----- 67=_____

68. (deg) $\frac{\sin(0.322^\circ) - \tan(0.322^\circ)}{\sin(0.322^\circ)}$ ----- 68=_____

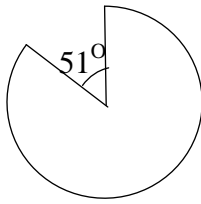
69. (deg) $\frac{\sin(53.9^\circ)}{1410 + 1590}$ ----- 69=_____

70. $(174 - 98.5)e^\pi - 0.746$ ----- 70=_____

71. Fred deposited \$3000 into an account that earns 2 1/4 % compounded annually. Calculate the number of years it will take to double the amount he originally deposited. ----- 71=_____INT.

72. Terry wanted to buy some new clothes for work. He could buy 2 dress shirts and one tie for \$81, or he could buy one shirt and 2 ties for \$66. Calculate the cost of one tie. ----- 72=\$_____

SECTOR OF A CIRCLE

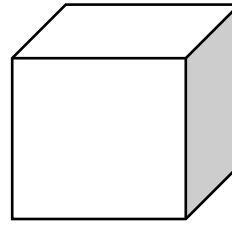


Area of Sector = 10025

Radius = ?

73=_____

CUBE



Volume = 3.73×10^5

Length of Inner Diagonal = ?

74=_____

75. $\frac{\text{Log}(5.20 \times 10^8 + 5.75 \times 10^8)}{47.6}$ ----- 75=_____

76. $\frac{\text{Log}(22.8 + 17.1)}{9.77 - 8.63}$ ----- 76=_____

77. $(15000)10^{(0.549)(5.95)}$ ----- 77=_____

78. $\frac{\text{Log}[21.3 + (1.55)(27.7)]}{2.86 + \text{Log}[532 + 355]}$ ----- 78=_____

79. $1 + 3 + 5 + \dots + 297$ ----- 79=_____

80. $\frac{1}{(0.25)} + \frac{1}{3(0.25)^3} + \frac{1}{5(0.25)^5} + \frac{1}{7(0.25)^7}$ ----- 80=_____

2019-2020 TMSCA Middle School Calculator Test #9 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -883 = -8.83×10^2	14 = -3.41×10^7	27 = -9130 = -9.13×10^3	39 = 1.23×10^8
2 = 16.0 = 1.60×10^1	15 = -35600 = -3.56×10^4	28 = -2.51×10^{-8}	40 = 4.35×10^{15}
3 = 321 = 3.21×10^2	16 = 0.189 = 1.89×10^{-1}	29 = 1.01 = 1.01×10^0	41 = 28700 = 2.87×10^4
4 = -2.86 = -2.86×10^0	17 = -30600 = -3.06×10^4	30 = -15.4 = -1.54×10^1	42 = 53700 = 5.37×10^4
5 = -62.0 = -6.20×10^1	18 = 3.87×10^{-5}	31 = 177 = 1.77×10^2	43 = -4.14 = -4.14×10^0
6 = -140 = -1.40×10^2	19 = 251 = 2.51×10^2	32 = 1.16×10^{12}	44 = 1.37 = 1.37×10^0
7 = 19.5 = 1.95×10^1	20 = 3.29×10^{-10}	33 = 0.00819 = 8.19×10^{-3}	45 = 0.120 = 1.20×10^{-1}
8 = 1.74 = 1.74×10^0	21 = 0.741 = 7.41×10^{-1}	34 = 0.00339 = 3.39×10^{-3}	46 = 1.38×10^6
9 = 1.48×10^7	22 = -1.26×10^9		
10 = 6.09×10^{10}	23 = 0.145 = 1.45×10^{-1}		
		35 = -1.39×10^{-11}	47 = 360 = 3.60×10^2
11 = 56.0 = 5.60×10^1	24 = 247 INT.	36 = 210 = 2.10×10^2	48 = 14.1 = 1.41×10^1
12 = 36.0 = 3060×10^1	25 = 6010 = 6.01×10^3	37 = 0.000334 = 3.34×10^{-4}	49 = 24300 = 2.43×10^4
13 = 77.1 = 7.71×10^1	26 = 34.0 = 3.40×10^1	38 = 2080 = 2.08×10^3	50 = 41300 = 4.13×10^4

2019-2020 TMSCA Middle School Calculator Test #9 Answer Key

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$$51 = -252$$
$$= -2.52 \times 10^2$$

$$52 = 1.83 \times 10^{-8}$$

$$53 = 9.41 \times 10^{-8}$$

$$54 = 45100$$
$$= 4.51 \times 10^4$$

$$55 = 0.501$$
$$= 5.01 \times 10^{-1}$$

$$56 = 5.50 \times 10^{-5}$$

$$57 = 6.43 \times 10^{-10}$$

$$58 = -0.187$$
$$= -1.87 \times 10^{-1}$$

$$59 = 91000$$
$$= 9.10 \times 10^4$$

$$60 = 0.167$$
$$= 1.67 \times 10^{-1}$$

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$$61 = 258$$
$$= 2.58 \times 10^2$$

$$62 = 2710$$
$$= 2.71 \times 10^3$$

$$63 = 5.04 \times 10^{-11}$$

$$64 = 2390$$
$$= 2.39 \times 10^3$$

$$65 = -5.27 \times 10^{42}$$

$$66 = 0.596$$
$$= 5.96 \times 10^{-1}$$

$$67 = -2.21$$
$$= -2.21 \times 10^0$$

$$68 = -1.58 \times 10^{-5}$$

$$69 = 0.000269$$
$$= 2.69 \times 10^{-4}$$

$$70 = 829$$
$$= 8.29 \times 10^2$$

$$71 = 32 \text{ INT.}$$

$$72 = \$17.00$$

Page 7

$$73 = 61.0$$
$$= 6.10 \times 10^1$$

$$74 = 125$$
$$= 1.25 \times 10^2$$

$$75 = 0.190$$
$$= 1.90 \times 10^{-1}$$

$$76 = 1.40$$
$$= 1.40 \times 10^0$$

$$77 = 2.77 \times 10^7$$

$$78 = 0.311$$
$$= 3.11 \times 10^{-1}$$

$$79 = 22200$$
$$= 2.22 \times 10^4$$

$$80 = 2570$$
$$= 2.57 \times 10^3$$

TMSCA 19-20 MS CA Test #9 Solutions to Word and Geometry Problems

<p>11. $\frac{274-2(81)}{2}$</p> <p>12. The horizontal leg is 6. The vertical leg is 12. $A = \frac{6(12)}{2}$</p> <p>13. Some calculators have a conversion key. It is also easy to substitute 180 degrees in place of π radians. $\frac{3(180)}{7}$</p> <p>24. Odd integers are spaced apart by 2's. The 4 integers are represented by $n, n + 2, n + 4, n + 6$ $n + n + 2 + n + 4 + n + 6 = 976$ Solve for n. $n = 241$. The largest is $n + 6 = 247$</p> <p>25. $\frac{12020}{2}$</p> <p>26. $x = \text{angle};$ $90 - x = \text{complement}$ $x + 2(90 - x) = 124$ Solve for x. $x = 56.0$; $90 - x = 34.0$</p> <p>35. $-\left(\frac{1}{e^{25}}\right)$</p> <p>36. The distances form the legs of a right triangle. Use Pythagorean Theorem to find the hypotenuse. Travel time is 2.25 hours. Distances are $70(2.25)$ and $62(2.25)$ $\sqrt{[(70)(2.25)]^2 + [(62)(2.25)]^2}$</p>	<p>37. $2\pi r = C$ $r = \frac{C}{2\pi} = \frac{.0021}{2\pi}$</p> <p>38. $4\sqrt{270000}$</p> <p>47. The sum of the exterior angles of a convex polygon is always 360 degrees.</p> <p>48. $28.5\pi(1000)$ inches Change to miles by dividing by 5280 and again by 12.</p> <p>49. $10799 + 3135 + \sqrt{10799^2 - 3135^2}$</p> <p>50. $\frac{\cos 56}{1} = \frac{23122}{x}$ so $x = \frac{23122}{\cos 56}$</p> <p>59. $A = \frac{1}{2}ap$ $A = \frac{1}{2}(158.284)(230 \times 5)$</p> <p>60. $\frac{3+2+1}{36}$</p> <p>61. $\left(\frac{22.7}{2}\right)^2 \pi - \frac{22.7(12.9)}{2}$</p>	<p>62. $LSA = 2\pi rh = 289.6$ $h = \frac{289.6}{2\pi(18.7)}$ Volume = $\pi r^2 = \pi(18.7)^2 h$ Substitute value for height into Volume formula.</p> <p>71. $6000 = 3000(1.0225)^x$ Divide by 3000 $2 = (1.0225)^x$ Take the log of both sides. $\log 2 = x \log(1.0225)$ $x = \frac{\log 2}{\log 1.0225}$ Round up to the next year (INT)</p> <p>72. $d = \#$ of dress shirts $t = \#$ of ties $\begin{cases} 2d + 1t = 81 \\ 1d + 2t = 66 \end{cases}$$\begin{cases} 2d + 1t = 81 \\ -2d - 4t = -132 \end{cases}$$\begin{aligned} -3t &= -51 \\ t &= \\$17.00 \end{aligned}$</p> <p>73. $\left(\frac{360-51}{360}\right)\pi r^2 = 10025$ $r^2 = \frac{10025(360)}{(360 - 51)\pi}$ $r = \sqrt{\frac{10025(360)}{(360 - 51)\pi}}$</p> <p>74. $side = \sqrt[3]{3.73 \times 10^5}$ Inner diagonal = $\left(\sqrt[3]{3.73 \times 10^5}\right)\sqrt{3}$</p>
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