

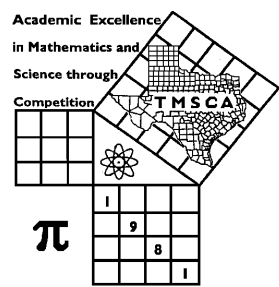
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

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



TMSCA MIDDLE SCHOOL CALCULATOR TEST #10 © FEBRUARY 4, 2017 GENERAL DIRECTIONS

- I. About this test:
- A. You will be given 30 minutes to take this test.
 - B. There are 80 problems on this test.
- 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*}, 1.23x10¹, 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.

2016-2017 TMSCA Middle School Calculator Test 10

1. $-1720 + 664$ ----- 1= _____

2. $-1 + 0.7 + 1.3$ ----- 2= _____

3. $128 - 82 - 31$ ----- 3= _____

4. $15 + \pi + 14 + 24$ ----- 4= _____

5. $567 - 845 + 304 - 1010$ ----- 5= _____

6. $-113 - 78.3 - 32.4 - 39.4 + 85.2$ ----- 6= _____

7. $(-1.71 - 0.24) + (0.88 - 1.64 - 0.211)$ ----- 7= _____

8. $2.82 + 3.98 + 4.15 + 0.722 + 2.72$ ----- 8= _____

9. $35.7 \times 105 \times 151$ ----- 9= _____

10. $379 \times 46 \times 4720 \times 509$ ----- 10= _____

11. A company made a log of 7 different employees' actual on-task hours in a forty hour week. One showed 40 hours, 2 at 39, 2 at 36 1 at 35 and 1 at 30. Calculate the mean of actual on task hours. --11= _____ hrs.

12. The second most popular train model scale in the world is the N scale, at 1:160. If a railroad car is 55 feet long, calculate the length of the car in N scale. -----12= _____ in.

13. The length of a rectangle is one foot more than two times its width. The perimeter of the rectangle is 28.9 inches. Calculate the length of the rectangle. -----13= _____ in.

14. $(129/49)[40 - 71]$ -----14= _____

15. $(22)[120 \times 38 \times 72]$ -----15= _____

16. $\left[\frac{94}{45}\right] [(82/138) - 0.181]$ -----16= _____

17. $\{(191)(219 - 151)(225)\} - 5.73 \times 10^5$ -----17= _____

18. $\left[\frac{(214 + 88.8)}{872/586}\right] \left[\frac{3.88 \times 10^{-4}}{0.196}\right]$ -----18= _____

19. $\left[\frac{(129/238) - (888/364)}{0.602/0.224}\right]$ -----19= _____

20. $\frac{0.315 + 0.416 + 0.154}{(0.021)(9.15 \times 10^{-5})(1.65 \times 10^{-7})}$ -----20= _____

21. $\frac{(\pi)(7/6)(16/18)}{53}$ -----21= _____

22. $\frac{(3830 \times 3820)/3480}{(2190 \times 5.63 \times 10^{-5}) + 0.0959}$ -----22= _____

23. $\frac{[-(6050 + 4240)(5280 - 5240)]}{(9.77 \times 10^{-5}/(0.219))}$ -----23= _____

24. Calculate the circumference of a circle with an area of 7.23×10^8 square feet. -----24= _____ ft.

25. There are 25 numbers less than 100 that are prime. Calculate the percentage of them that have at least one digit that is a three. ---25= _____ %

26. Silly Sally took a calculator test. She answered #1 correctly and then skipped to #80 and answered it correctly. If she does nothing else, calculate her score. -----26= _____ INT.

27. $\frac{(1.98 + 11.4)(5.73 + 27.5)}{(9.96 \times 10^{10})}$ -----27= _____

28. $[2710 - (4130 + 1710)] + [(715)(3480 - 3490)]$ -----28= _____

29. $(3.12)[(0.428/1.41)(0.206/0.387)]$ -----29= _____

30. $\frac{1}{-0.359} + \frac{1}{(\pi)(0.54 - 0.691)}$ -----30= _____

31. $(50.7)\left[\frac{0.843}{(6.38 \times 10^{12})}\right]$ -----31= _____

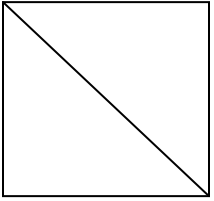
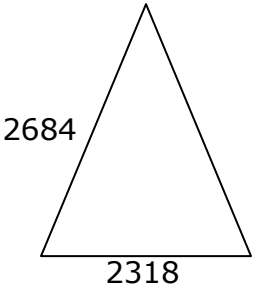
32. $\frac{1}{\pi} + \frac{1}{(2.35 - 4.77)}$ -----32= _____

33. $\left[\frac{1/1620}{1/1910}\right][2.03 \times 10^6]$ -----33= _____

34. $\frac{1}{195} - \frac{1}{(407 + 164)}$ -----34= _____

35. Set A contains 15 elements. Calculate the number proper subsets this set has. -----35= _____ INT.

36. If $f(x) = 5x^3 + 18$ and $g(x) = 22x - 5$, calculate $f(g(5))$. -----36= _____

<p style="text-align: center;">SQUARE</p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>Perimeter = 0.0000345</p> <p>Diagonal = ?</p> </div> </div> <p>37= _____</p>	<p style="text-align: center;">ISOSCELES TRIANGLE</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>Area = ?</p> </div> </div> <p>38= _____</p>
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39. $\frac{(1860 + 10700)^3}{(0.0203 - 0.0978)^2}$ -----39= _____

40. $(103 + 83.6)^2(11.5 + 4.77)^2$ -----40= _____

41. $\left[\frac{650}{4200}\right](39.5 + 130)^3$ -----41= _____

42. $\sqrt{981 - 435 + 416} - \sqrt{533}$ -----42= _____

43. $(1/\pi)^4 \sqrt[4]{\frac{0.194 + 0.213}{7.21 - 4.6}}$ -----43= _____

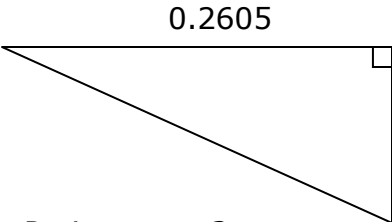
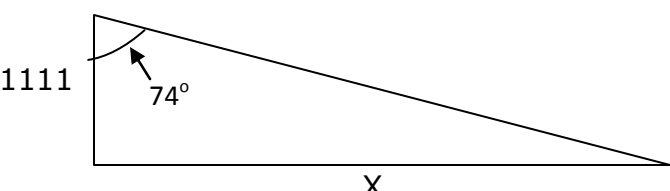
44. $(1/(0.00182))(52000 - 31900)^2$ -----44= _____

45. $\frac{1}{\sqrt{1080 + 282 + 540}} + \left(\frac{1}{\sqrt{9.18}}\right)^3$ -----45= _____

46. $\frac{(34400 + 33300)^{1/3}}{(19.7 - 13.4)^{1/4}}$ -----46= _____

47. Two complementary angles have the measures $(5x + 4)^\circ$ and $(2x + 8)^\circ$. Calculate the measure of the largest angle. -----47= _____^o

48. A mega second is 1 million seconds. Calculate the number of mega seconds in a standard year. -----48= _____ ms

<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">Perimeter = ?</p> <p>49= _____</p>	<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>50= _____</p>
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51. $\left[\frac{402 + 1450 + \sqrt{2.85 \times 10^6 + 2.03 \times 10^6}}{554/306} \right]^3$ -----51= _____

52. $\frac{\sqrt{25.6 + \pi + 12.5}}{(143 - 136 + 143)^2}$ -----52= _____

53. $\frac{(0.0419 + 0.0345 - 0.0382)^3}{\sqrt{16.7 + 10.3 + 7.41}}$ -----53= _____

54. $0.0212 + \sqrt{(112)/(4720)} - (0.141 + 0.26)^2$ -----54= _____

55. $(1.49)^2 \sqrt{(0.448)/(0.249)} - (0.357 + 1.51)$ -----55= _____

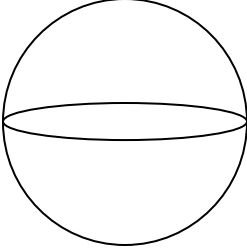
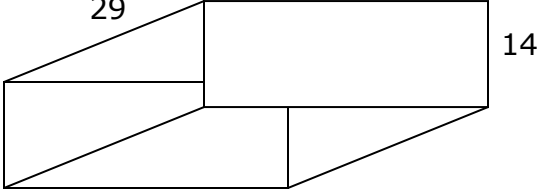
56. $\sqrt{\frac{(9600)(45600)}{(24700)(23100)}} - 0.853 + 0.18$ -----56= _____

57. $\sqrt{\frac{(382)(5.07)}{(30.6) + (7.31)}} - 27.2$ -----57= _____

58. $\sqrt{\frac{1/(3590 - 1920)}{(1090)(14.2 + 13.7)^{-5}}}$ -----58= _____

59. Ricky has 500 Liters of a 75% alcohol solution. If 3000 Liters of water are added to the solution, calculate the alcohol percentage of the new solution. -----59= _____%

60. Calculate the number of 5 digit numbers that can be formed from the digits 1 – 9 inclusive if no repetition is allowed. -----60= _____ INT.

<p style="text-align: center;">SPHERE</p> <div style="display: flex; align-items: center;">  <div> <p>Area of Great Circle = 7900000</p> <p style="text-align: center;">Surface Area = ?</p> <p>61= _____</p> </div> </div>	<p style="text-align: center;">RECTANGULAR PRISM</p> <div style="display: flex; align-items: center;">  <div> <p style="text-align: center;">Inner Diagonal = ?</p> <p>62= _____</p> </div> </div>
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63. $\frac{8!/9!}{7! + 6!}$ -----63= _____

64. $(279 - \pi)e^{0.376}$ -----64= _____

65. $(\text{deg}) \frac{\tan(5.45^\circ)}{366}$ -----65= _____

66. $(\text{deg}) [8.06]\cos(11.4^\circ - 61.9^\circ)$ -----66= _____

67. $(\text{rad}) \frac{\sin(258)}{1290/76.2}$ -----67= _____

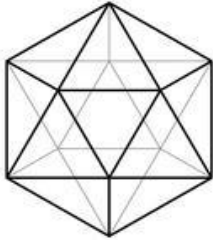
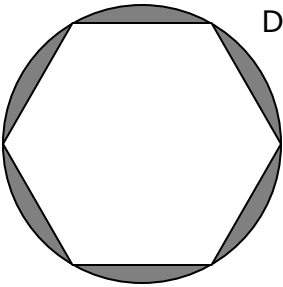
68. $(\text{rad}) \tan[(0.323 - 0.764)(0.894)]$ -----68= _____

69. $(\text{deg}) \frac{\sin(668^\circ)}{3.91 + 3.16}$ -----69= _____

70. $(43 - 15.1 + 34.1)^{5/3}$ -----70= _____

71. Passes to a local concert are \$85 each for stadium seats and \$150 for floor seats. If 1050 passes were sold for a total of \$105,500, calculate how many floor seats were sold. -----71= _____ INT.

72. Calculate the odds of rolling a double on a pair of dice. -----72= _____

<p style="text-align: center;">REGULAR ICOSAHEDRON</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <p>Each edge = 27.24 Surface Area = ?</p> </div> </div> <p style="margin-top: 20px;">73= _____</p>	<p style="text-align: center;">CIRCLE AND REGULAR HEXAGON</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <p>Diameter of Circle = 235.9</p> <p>Shaded Area = ?</p> </div> </div> <p style="margin-top: 20px;">74= _____</p>
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75. $\frac{\text{Log}(17300 + 30200)}{516 - 1080}$ -----75= _____

76. $\text{Ln} \left[\frac{228 + 220 + 127}{192 + 166 - 89.3} \right]$ -----76= _____

77. $(9500)_{10}^{(0.122)(1.15)}$ -----77= _____

78. $\frac{\text{Log}[6.2 + (3.5)(1.93)]}{1.45 + \text{Log}[426 + 685]}$ -----78= _____

79. $1 + 2 + 3 + \dots + 912$ -----79= _____

80. $(0.17) - \frac{(0.17)^2}{2} + \frac{(0.17)^3}{3} - \frac{(0.17)^4}{4}$ -----80= _____

2016-2017 TMSCA Middle School Calculator Test 10 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -1060 = -1.06×10^3	14 = -81.6 = -8.16×10^1	27 = 4.46×10^{-9}	39 = 3.30×10^{14}
2 = 1.00 = 1.00×10^0	15 = 7.22×10^6	28 = -10300 = -1.03×10^4	40 = 9.22×10^6
3 = 15.0 = 1.50×10^1	16 = 0.863 = 8.63×10^{-1}	29 = 0.504 = 5.04×10^{-1}	41 = 754000 = 7.54×10^5
4 = 56.1 = 5.61×10^1	17 = 2.35×10^6	30 = -4.89 = -4.89×10^0	42 = 7.93 = 7.93×10^0
5 = -984 = -9.84×10^2	18 = 0.403 = 4.03×10^{-1}	31 = 6.70×10^{-12}	43 = 0.200 = 2.00×10^{-1}
6 = -178 = -1.78×10^2	19 = -0.706 = -7.06×10^{-1}	32 = -0.0949 = -9.49×10^{-2}	44 = 2.22×10^{11}
7 = -2.92 = -2.92×10^0	20 = 2.79×10^{12}	33 = 2.39×10^6	45 = 0.0589 = 5.89×10^{-2}
8 = 14.4 = 1.44×10^1	21 = 0.0615 = 6.15×10^{-2}	34 = 0.00338 = 3.38×10^{-3}	46 = 25.7 = 2.57×10^1
9 = 566000 = 5.66×10^5	22 = 19200 = 1.92×10^4	35 = 32767 INT.	47 = 59.7 = 5.97×10^1
10 = 4.19×10^{10}	23 = -9.23×10^8	36 = 5790000 = 5.79×10^6	48 = 31.5 = 3.15×10^1
11 = 36.4 = 3.64×10^1	24 = 95300 = 9.53×10^4	37 = 0.0000122 = 1.22×10^{-5}	49 = 0.664 = 6.64×10^{-1}
12 = 4.13 = 4.13×10^0	25 = 36.0 = 3.60×10^1	38 = 2810000 = 2.81×10^6	50 = 3870 = 3.87×10^3
13 = 13.6 = 1.36×10^1	26 = -302 INT.		

2016-2017 TMSCA Middle School Calculator Test 10 Answer Key

Page 5

$$51 = 1.13 \times 10^{10}$$

$$52 = 0.000285 \\ = 2.85 \times 10^{-4}$$

$$53 = 9.50 \times 10^{-6}$$

$$54 = 0.0144 \\ = 1.44 \times 10^{-2}$$

$$55 = 1.11 \\ = 1.11 \times 10^0$$

$$56 = 0.203 \\ = 2.03 \times 10^{-1}$$

$$57 = -20.1 \\ = -2.01 \times 10^1$$

$$58 = 3.05 \\ = 3.05 \times 10^0$$

$$59 = 10.7 \\ = 1.07 \times 10^1$$

$$60 = 15120 \text{ INT.}$$

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$$61 = 3.16 \times 10^7$$

$$62 = 50.6 \\ = 5.06 \times 10^1$$

$$63 = 0.0000193 \\ = 1.93 \times 10^{-5}$$

$$64 = 402 \\ = 4.02 \times 10^2$$

$$65 = 0.000261 \\ = 2.61 \times 10^{-4}$$

$$66 = 5.13 \\ = 5.13 \times 10^0$$

$$67 = 0.0224 \\ = 2.24 \times 10^{-2}$$

$$68 = -0.416 \\ = -4.16 \times 10^{-1}$$

$$69 = -0.111 \\ = -1.11 \times 10^{-1}$$

$$70 = 971 \\ = 9.71 \times 10^2$$

$$71 = 250 \text{ INT.}$$

$$72 = 0.200 \\ = 2.00 \times 10^{-1}$$

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$$73 = 6430 \\ = 6.43 \times 10^3$$

$$74 = 7560 \\ = 7.56 \times 10^3$$

$$75 = -0.00829 \\ = -8.29 \times 10^{-3}$$

$$76 = 0.761 \\ = 7.61 \times 10^{-1}$$

$$77 = 13100 \\ = 1.31 \times 10^4$$

$$78 = 0.247 \\ = 2.47 \times 10^{-1}$$

$$79 = 416000 \\ = 4.16 \times 10^5$$

$$80 = 0.157 \\ = 1.57 \times 10^{-1}$$

TMSCA 16-17 MS CA Test #10 Solutions to Word and Geometry Problems

11. $\frac{40+2(39)+2(36)+35+30}{7}$

12. 55 ft = 660 inches

$\frac{1}{160} = \frac{x}{660}; x = \frac{660}{160}$

13. w = width;

2w + 12 = length

Perimeter = 6w + 24 = 28.9;

Width = $\frac{28.9-24}{6}$.

Length = $2\left(\frac{28.9-24}{6}\right) + 12$

24. $\pi r^2 = 7.23 \times 10^8$

$r = \sqrt{\frac{7.23 \times 10^8}{\pi}}$

$C = 2\pi r = 2\pi\left(\sqrt{\frac{7.23 \times 10^8}{\pi}}\right)$

25. Prime numbers less than 100 that have at least one 3:

3, 13, 23, 31, 37, 43, 53, 73,

83. $\frac{n\%}{100} = \frac{9}{25}$

26. Last one attempted times 5 minus misses times 9. She missed 78 of the 80 problems. $80(5)-78(9)$

35. $2^{15} - 1$. Look at SHOW key for exact INT.

36. $g(5) = 22(5) - 5 = 105$
 $f(g(5)) = f(105) = 5(105)^3 + 18$

37. $\left(\frac{.0000345}{4}\right)\sqrt{2}$

38. height =

$\sqrt{2684^2 - \left(\frac{2318}{2}\right)^2}$

Area = $\frac{\left(\sqrt{2684^2 - \left(\frac{2318}{2}\right)^2}\right)(2318)}{2}$

47. Sum of angles = 90^0

$5x + 4 + 2x + 8 = 90$.

$7x + 12 = 90; x = \frac{78}{7}$

Largest angle = $5x + 4 =$

$5\left(\frac{78}{7}\right) + 4$

48.

$\frac{(365)(24)(60)(60)}{1000000}$

49. $\sqrt{.2605^2 + .1180^2} + .2605 + .1180$

50. $\frac{\tan 74}{1} = \frac{x}{1111}$

so $x = 1111(\tan 74)$

59.

	liters	%acid	acid
orig	500	.75	375
water	3000	0	0
mix	3500	X	3500x

$375 + 0 = 3500x; x = \frac{375}{3500}$

Multiply by 100 to make a %

60. $(9)(8)(7)(6)(5)$

61. Surface area of a sphere is $4\pi r^2$ so $SA = 4(7900000)$

62. $\sqrt{29^2 + 39^2 + 14^2}$

71. x: # of stadium seats

F: # of floor seats

$X + F = 1050$

$85X + 150F = 105500$

Multiply first equation by -85. Add the equations together to get: $65F = 16250; F = 250$

72. $\frac{6}{30}$ since there are 6 double rolls and 30 rolls that are not doubles.

73. An icosahedron has 20 equilateral triangle faces.

Area of equilateral triangle:

$\frac{s^2\sqrt{3}}{4}$

Surface area = $20\left(\frac{27.24^2\sqrt{3}}{4}\right)$

74. A hexagon consists of 6 equilateral triangles whose sides = the radius. Find area of circle. Then subtract the area of 6 equilateral triangles. See the formula in #73.

$\pi\left(\frac{235.9}{2}\right)^2 - 6\left[\left(\frac{235.9}{2}\right)^2\frac{\sqrt{3}}{4}\right]$