

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

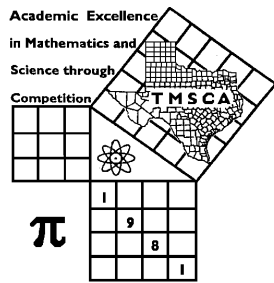
PLACE LABEL BELOW

Name: _____ School: _____

SS/ID Number: _____ City: _____

Grade: 5 6 7 8

Classification: 1A 2A 3A 4A 5A 6A



TMSCA MIDDLE SCHOOL CALCULATOR

TEST #2 ©

OCTOBER 29, 2016

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 2

1. $1150 + 171$ ----- 1= _____

2. $36 + 73 + 81$ ----- 2= _____

3. $-1970 + 2000 + 1080$ ----- 3= _____

4. $13 - \pi - 12 + 14$ ----- 4= _____

5. $-80 - 112 - 177 - 117$ ----- 5= _____

6. $-61.7 - 29.2 - 148 + 52.6 + 75.5$ ----- 6= _____

7. $(4.42 - 1.16) + (\pi - 5.34 - 1.39)$ ----- 7= _____

8. $(-3.61 + 0.71 - 2.22) - (3.53 + 0.84)$ ----- 8= _____

9. $174 \times 257 \times 568$ ----- 9= _____

10. $2960 \times 7320 \times 6290 \times 457$ ----- 10= _____

11. Mary attempted all the problems on her calculator test through and including number 74. She got 12 of those incorrect. Calculate her score. ----- 11= _____ INT.

12. A square has a perimeter of two hundred fifteen meters. Calculate the area of the square in square meters. ----- 12= _____ sq. m

13. Calculate the range of the prime numbers that are less than one hundred. ----- 13= _____ INT.

14. $(-172/25)[170 - 46]$ -----14= _____

15. $(759)[692 \times 476/930]$ -----15= _____

16. $\left[\frac{55}{108}\right] [(243/311) - 0.415]$ -----16= _____

17. $\{121/57\} \left[\frac{90}{50 + 71}\right]$ -----17= _____

18. $\left[\frac{(367/733) - (616/292)}{116/41.4}\right]$ -----18= _____

19. $\left[\frac{26/46}{119/31}\right] \{\pi + 1.78 - 1.61\}$ -----19= _____

20. $\frac{0.0215 + 0.0202 + 0.0862}{(0.207)(0.24)(77.6)}$ -----20= _____

21. $\frac{(8.55)(0.0811)}{0.00231} (141 - 176)$ -----21= _____

22. $\left[\frac{3570 + 3400}{4800 - 1400}\right] \left[\frac{1280}{2790}\right]$ -----22= _____

23. $\frac{(\pi)(130/280)(375/249)}{(414/351)}$ -----23= _____

24. The ratio of girls to boys in the school is 7 to 8. If the school has a total of 780 students in the school, calculate the number of girls in the school. -----24= _____ INT.

25. Angle A and Angle B are supplementary angles. If Angle A is 42.8° , calculate the measure of Angle B. -----25= _____^o

26. A car stereo is listed for \$359.99. The car stereo is 20% off this week. Calculate the total cost of the stereo at the sale price and with a 6.25% sales tax. -----26=\$ _____

27. $\frac{(0.872 - 2.88)(0.0178 + 0.031)}{(3.64 \times 10^{11})}$ -----27= _____

28. $(0.0261)[(0.186/0.163)(0.0314 + 0.125)]$ -----28= _____

29. $(123)[(0.0044/0.00321)(12.5/21.1)]$ -----29= _____

30. $(0.186)\left[\frac{8.12}{(1.43 \times 10^{11})}\right]$ -----30= _____

31. $\frac{1}{-0.0239} + \frac{1}{(\pi)(0.0379 - 0.0592)}$ -----31= _____

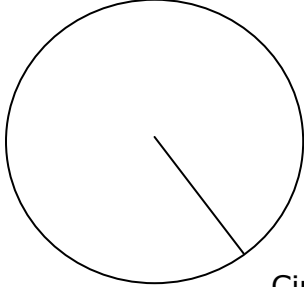
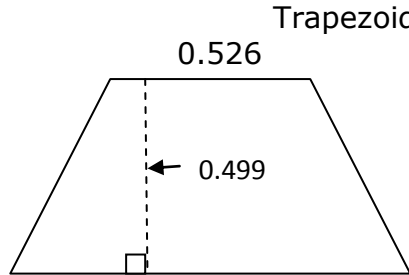
32. $[0.00712]\left[\frac{1/0.516}{1/1.56}\right]$ -----32= _____

33. $\left[\frac{1/212}{1/189}\right] + [0.178]$ -----33= _____

34. $1/(0.199 - 0.408) - 1/(-0.185)$ -----34= _____

35. Pi over eleven radians is equal to how many degrees? -----35= _____ °

36. Adam can hoe the garden in 2 hours 25 minutes. Eve can do the same task in 1 hour 55 minutes. Calculate the time it will take if they worked together. -----36= _____ hrs.

<p style="text-align: center;">Circle</p>  <p style="text-align: right;">Area = 733</p> <p style="text-align: right;">Circumference = ?</p> <p>37= _____</p>	<p style="text-align: center;">Trapezoid</p>  <p style="text-align: right;">Area = ?</p> <p>38= _____</p>
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39. $(27.1 + 89.6)^2(2.74 + 4.78)^2$ -----39= _____

40. $(0.0833 + 0.12 + 0.0511)^2(222 + 200)^2$ -----40= _____

41. $\sqrt[3]{\frac{1.02 + 1.4}{0.277 - 0.268}}$ -----41= _____

42. $(1/\pi)\sqrt[3]{\frac{0.0345 + 0.134}{3.72 - 1.1}}$ -----42= _____

43. $\sqrt{(4730/2090) + 0.806 - 0.252}$ -----43= _____

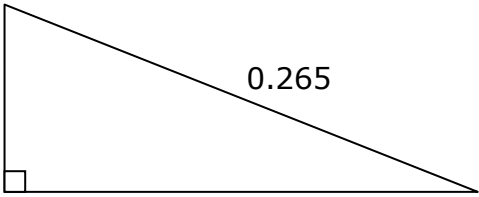
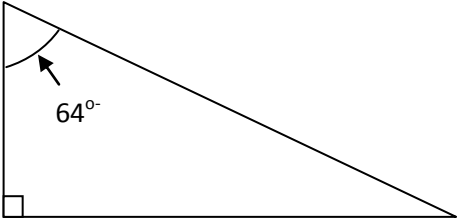
44. $(16.4)\sqrt{1230 + 551 + 1670}$ -----44= _____

45. $(56.2)\sqrt[4]{315 + 711 - 280}$ -----45= _____

46. $\frac{1}{\sqrt{2240 + 2020 + 2150}} + \left(\frac{1}{\sqrt{2.56}}\right)^4$ -----46= _____

47. Calculate 562^{859} . -----47= _____

48. Calculate the value of 45611 Base 8 to base 10. -----48= _____ INT.

<p style="text-align: center;">Right Triangle</p>  <p style="text-align: center;">Area = ?</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. $\left[\frac{3120 - 895 + \sqrt{3.08 \times 10^8 / 62.5}}{-8.81 + 21.7} \right]^3$ -----51= _____

52. $\frac{(0.388 + 0.36 - 0.613)^4}{\sqrt{1.19 \times 10^5 + 1.26 \times 10^5 + 1.58 \times 10^5}}$ -----52= _____

53. $\left[\frac{\sqrt{\sqrt{2.72 \times 10^5 - 2.00 \times 10^5}}}{-(8970 - 17400)} \right]^2 [7.51 \times 10^5 + 7.22 \times 10^5]$ -----53= _____

54. $1.92 + \sqrt{(843)/(83.6)} - (1.47 + 0.802)^2$ -----54= _____

55. $(0.792)^2 \sqrt{(196)/(3.46)} - (1.73 + 4.69)$ -----55= _____

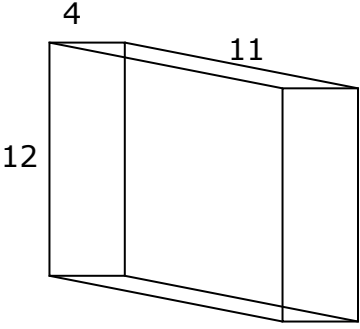
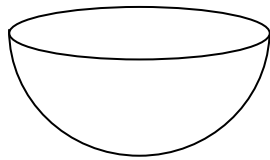
56. $\sqrt{\frac{(62600)(1.65 \times 10^5)}{(11800)(10900)}} - 8.36 + 3.99$ -----56= _____

57. $(\text{deg}) \sin(1240^\circ) + (677/625)$ -----57= _____

58. $(\text{rad}) \sin(6.44) + (13.5/16.2)$ -----58= _____

59. A single engine prop plane travels 125 miles in 2 hours with the wind. The return trip against the same wind took 3.5 hours. Calculate the rate of the wind. -----59= _____ mph.

60. Richard earns \$24.80 per hour and is paid time and a half for over time above 40 hours. Richard worked a total of 51 hours. Calculate his weekly pay for this week. -----60=\$ _____

<p style="text-align: center;">Rectangular Prism</p>  <p style="text-align: right;">Volume = ?</p> <p>61= _____</p>	<p style="text-align: center;">Hemisphere</p>  <p style="text-align: right;">Volume = 777</p> <p style="text-align: right;">Surface Area = ?</p> <p>62= _____</p>
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63. $\frac{12! - 14!}{26!}$ -----63= _____

64. (deg) $\frac{\tan(47.4^\circ)}{1580}$ -----64= _____

65. $(2.37 \times 10^8 - 8.30 \times 10^8)^5 (3.30 \times 10^9)$ -----65= _____

66. (deg) $[65.8] \tan(519^\circ - 464^\circ)$ -----66= _____

67. (rad) $\frac{\sin(20.1)}{4710/65.9}$ -----67= _____

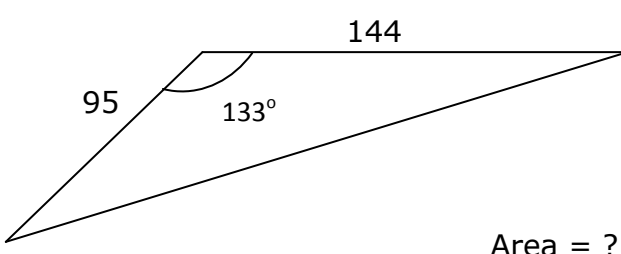
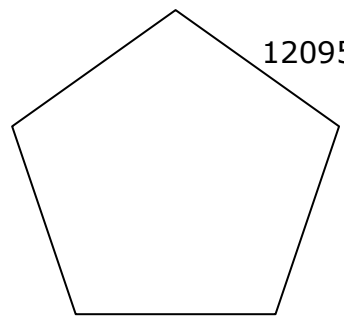
68. (deg) $\frac{\sin(3.23^\circ) - \tan(3.23^\circ)}{\sin(3.23^\circ)}$ -----68= _____

69. (rad) $\tan[(3.15 - 1.61)(35.8)]$ -----69= _____

70. $(138 - 256)e^{\pi - 0.983}$ -----70= _____

71. The diameter of a right circular cone is 0.52 inches and the height of the cone is 1.94 inches. Calculate the volume of the cone in cubic inches. -----71= _____ cu. in.

72. Calculate the odds of selecting a blue marble from a jar that contains 50 red, 50 blue, 40 yellow and 25 white marbles. -----72= _____

<p style="text-align: center;">Scalene Triangle</p>  <p style="text-align: right;">Area = ?</p> <p>73= _____</p>	<p style="text-align: center;">Regular Pentagon</p>  <p style="text-align: right;">Area = ?</p> <p>74= _____</p>
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75. $\frac{\text{Log}(1.68 \times 10^7 + 2.22 \times 10^7)}{27.8}$ -----75= _____

76. $\frac{36.8 + \sqrt{(14)(35.7) + (4.4)(11.2)}}{\sqrt{\sqrt{8.52 + 3.67}}}$ -----76= _____

77. $\text{Log}(81.4 + 88.8 + 26)$ -----77= _____

78. $\frac{\text{Log}[5.67 \times 10^5 + (431)(2890)]}{0.667 + \text{Log}[4.36 + 4.28]}$ -----78= _____

79. $4 + 6 + 8 + \dots + 198$ -----79= _____

80. $1 + 0.991 + (0.991)^2 + \frac{(0.991)^4}{8} - \frac{(0.991)^5}{15}$ -----80= _____

2016-2017 TMSCA Middle School Calculator Test 2 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = 1320 = 1.32×10^3	14 = -853 = -8.53×10^2	27 = -2.69×10^{-13}	39 = 770000 = 7.70×10^5
2 = 190 = 1.90×10^2	15 = 269000 = 2.69×10^5	28 = 0.00466 = 4.66×10^{-3}	40 = 11500 = 1.15×10^4
3 = 1110 = 1.11×10^3	16 = 0.187 = 1.87×10^{-1}	29 = 99.9 = 9.99×10^1	41 = 6.45 = 6.45×10^0
4 = 11.9 = 1.19×10^1	17 = 1.58 = 1.58×10^0	30 = 1.06×10^{-11}	42 = 0.128 = 1.28×10^{-1}
5 = -486 = -4.86×10^2	18 = -0.574 = -5.74×10^{-1}	31 = -56.8 = -5.68×10^1	43 = 1.68 = 1.68×10^0
6 = -111 = -1.11×10^2	19 = 0.488 = 4.88×10^{-1}	32 = 0.0215 = 2.15×10^{-2}	44 = 963 = 9.63×10^2
7 = -0.328 = -3.28×10^{-1}	20 = 0.0332 = 3.32×10^{-2}	33 = 1.07 = 1.07×10^0	45 = 294 = 2.94×10^2
8 = -9.49 = -9.49×10^0	21 = -10500 = -1.05×10^4	34 = 0.621 = 6.21×10^{-1}	46 = 0.165 = 1.65×10^{-1}
9 = 2.54×10^7	22 = 0.941 = 9.41×10^{-1}	35 = 16.4 = 1.64×10^1	47 = 1.06×10^{2362}
10 = 6.23×10^{13}	23 = 1.86 = 1.86×10^0	36 = 1.07 = 1.07×10^0	48 = 19337 INT.
11 = 262 INT.	24 = 364 INT.	37 = 96.0 = 9.60×10^1	49 = 0.0173 = 1.73×10^{-2}
12 = 2890 = 2.89×10^3	25 = 137 = 1.37×10^2	38 = 0.369 = 3.69×10^{-1}	50 = 228 = 2.28×10^2
13 = 95 INT.	26 = \$305.99		

2016-2017 TMSCA Middle School Calculator Test 2 Answer Key

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$$\begin{aligned} 51 &= 4.10 \times 10^7 \\ 52 &= 5.23 \times 10^{-7} \\ 53 &= 5.56 \\ &= 5.56 \times 10^0 \\ 54 &= -0.0665 \\ &= -6.65 \times 10^{-2} \\ 55 &= -1.70 \\ &= -1.70 \times 10^0 \\ 56 &= 4.59 \\ &= 4.59 \times 10^0 \\ 57 &= 1.43 \\ &= 1.43 \times 10^0 \\ 58 &= 0.990 \\ &= 9.90 \times 10^{-1} \\ 59 &= 13.4 \\ &= 1.34 \times 10^1 \\ 60 &= \$1401.20 \end{aligned}$$

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$$\begin{aligned} 61 &= 528 \\ &= 5.28 \times 10^2 \\ 62 &= 487 \\ &= 4.87 \times 10^2 \\ 63 &= -2.15 \times 10^{-16} \\ 64 &= 0.000688 \\ &= 6.88 \times 10^{-4} \\ 65 &= -2.42 \times 10^{53} \\ 66 &= 94.0 \\ &= 9.40 \times 10^1 \\ 67 &= 0.0133 \\ &= 1.33 \times 10^{-2} \\ 68 &= -0.00159 \\ &= -1.59 \times 10^{-3} \\ 69 &= -6.44 \\ &= -6.44 \times 10^0 \\ 70 &= -1020 \\ &= -1.02 \times 10^3 \\ 71 &= 0.137 \\ &= 1.37 \times 10^{-1} \\ 72 &= 0.435 \\ &= 4.35 \times 10^{-1} \end{aligned}$$

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$$\begin{aligned} 73 &= 5000 \\ &= 5.00 \times 10^3 \\ 74 &= 2.52 \times 10^8 \\ 75 &= 0.273 \\ &= 2.73 \times 10^{-1} \\ 76 &= 58.0 \\ &= 5.80 \times 10^1 \\ 77 &= 2.29 \\ &= 2.29 \times 10^0 \\ 78 &= 3.90 \\ &= 3.90 \times 10^0 \\ 79 &= 9900 \\ &= 9.90 \times 10^3 \\ 80 &= 3.03 \\ &= 3.03 \times 10^0 \end{aligned}$$

TMSCA 15-16 MS CA Test #2 Solutions to Word and Geometry Problems

11. $74 \times 5 - 12 \times 9$

12. $\frac{215}{4} = \text{side of square}$

$$A = \left(\frac{215}{4}\right)^2$$

13. $97 - 2$

24. $\frac{\text{girls}}{\text{total}} = \frac{7}{15} = \frac{x}{780}$

$$x = \frac{7(780)}{15}$$

25. $180 - 42.8$

26. 20% off means 80% is paid. $359.99(.80)(1.0625)$
Look at SHOW key for exact cents. 1 cent error is allowed.

35. $\pi \text{ radians} = 180^\circ$

$$\frac{\pi/11}{x} = \frac{\pi}{180}$$

$$x = \frac{180(\frac{\pi}{11})}{\pi}$$

36. $\frac{(2\frac{25}{60})(1\frac{55}{60})}{2\frac{25}{60} + 1\frac{55}{60}}$

37. $733 = \pi r^2$

$$r = \sqrt{\frac{733}{\pi}} \text{ so } C = 2\pi r = 2\pi \sqrt{\frac{733}{\pi}}$$

38. $A = \frac{(b_1 + b_2)h}{2} = \frac{(.526 + .952).499}{2}$

47. **562**⁸⁵⁹ 859 562

(Look at the digits to the left of the decimal. This gives 2362 for the exponent. Write down 2362.)

2362

(This gives 1.06 E0 which is the first part of your answer.

The answer is 1.06×10^{2362}). This is done on the RPN calculator.

48. $4(8^4) + 5(8^3) + 6(8^2) + 1(8) + 1$

49. Height = $\sqrt{.265^2 - .202^2}$
Area = $\frac{.202h}{2}$

50. $\frac{\tan 64}{1} = \frac{x}{111}$

$$x = 111(\tan 64)$$

59. $t \times r = \text{distance}$
 $2(p+w) = 125$
 $3.5(p-w) = 125$
Solve the system for w.

60. $24.80(40) + 24.80(1.5)(11)$ See SHOW key for cents.

61. $12(11)4$

62. $V = \frac{2}{3}\pi r^3; 777 = \frac{2}{3}\pi r^3$

$$r = \sqrt[3]{\frac{777(3)}{2\pi}}$$

$$SA = 3\pi r^2 = 3\pi \left(\sqrt[3]{\frac{777(3)}{2\pi}}\right)^2$$

71. $V = \frac{1}{3}\pi r^2 h$

$$V = \frac{1}{3}\pi \left(\frac{.52}{2}\right)^2 (1.94)$$

72. 50 blue, 115 not blue
Odds = $\frac{50}{115}$

73. $A = \frac{1}{2}ab\text{Sin}C$

$$A = \frac{1}{2}(95)(144)\text{Sin}133$$

74. Great formula for area of any regular polygon:

$$\frac{\text{perimeter}^2}{\tan\left(\frac{180}{n}\right)4n}$$

Where n = number of sides.

$$\frac{(12095 \times 5)^2}{\tan\left(\frac{180}{5}\right)4(5)}$$