8

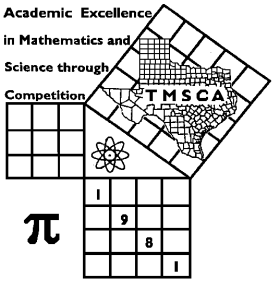
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



T M S C A M I D D L E S C H O O L

C A L C U L A T O R

T E S T # 2 ©

O C T O B E R 2 6 , 2 0 1 9

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 #2

1. 965 – 2630 ---------- 1=_____

2. 50 + 8 + 30 ---------- 2=_____

3. 858 + 1760 + 1450 ---------- 3=_____

4. π – 12 – 3 + 2 ---------- 4=_____

5. 86 – 75 + 192 – 175 ---------- 5=_____

6. –108 – 132 – 44.9 – 143 + 163 ---------- 6=_____

7. (2.35 – 1.93) + (3.47 – 0.7 – 3.48) ---------- 7=_____

8. 2.22 – 0.476 + 1.82 – 1.9 – 0.852 ---------- 8=_____

9. 191 x 186 x 139 ---------- 9=_____

10. 1290 x 7060 x 62.2 x 6960 ---------- 10=_____

11. Calculate the mean of the first ten prime numbers. ---------- 11=_____

12. Calculate the radius of a circle with area 31.8 inches squares. --- 12=_____in.

13. Eight hundred fifty-two is what percent less than five thousand? 13=_____%

14. (143)[391 x 289 x 510] ---------- 14=_____

15. (386/631)[504 – 386] ---------- 15=_____

16. (77 + 48)[86 – 122 – 50] ---------- 16=_____

17. $\{456/131\}\left[\frac{422}{295 + 257}\right]$ ---------- 17=_____

18. $\left[\frac{(37.4 + 46)}{57/245}\right]\left[\frac{0.016}{0.0173}\right]$ ---------- 18=_____

19. $\frac{(83/87) + (113/115)}{(0.0438 - 0.241)}$ ---------- 19=_____

20. $\frac{0.726 + 0.975 + 0.305}{(32.3)(21.9)(0.0848)}$ ---------- 20=_____

21. $\frac{(0.0271)(0.05)}{0.119}(0.982 - 0.255)$ ---------- 21=_____

22. $\frac{(\pi)(126/183)(79/60)}{(192/221)}$ ---------- 22=_____

23. $\frac{(0.0126 + 0.0112 - 0.00838)}{\{(0.00156 - 0.0018)/(63.9)\}}$ ---------- 23=_____

24. Calculate the number of acres in 2.81 square miles. ---------- 24=_____ac.

25. The sum of 3 consecutive odd integers is 3009. Calculate the largest of the integers. ---------- 25=_____INT.

26. A car dealership has 850 new cars in stock. They sold 5 cars on Monday, 3 on Tuesday, 4 on Wednesday, two on Thursday, and 13 on Friday. Calculate the percentage of cars not sold by Friday. 26=_____%

27. $\dfrac{(3.76\text{x}10^{12}) + (8.51\text{x}10^{12})}{(-3.74)(1.44) - 3.32}$ ---------- 27=_____

28. $(0.0713)\left[(2.87/2.43)(\pi + 6.38)\right]$ ---------- 28=_____

29. $\dfrac{(0.0175 - 0.0119)(1.2 + 0.239)}{(1.31\text{x}10^{11})}$ ---------- 29=_____

30. $[0.0127]\left[\dfrac{1/56.1}{1/(38)}\right]$ ---------- 30=_____

31. $\dfrac{1}{-40} + \dfrac{1}{(\pi)(39.3 - 65.6)}$ ---------- 31=_____

32. $(8.61)\left[(7.26\text{x}10^{-12}) - (3.26\text{x}10^{-12})\right]$ ---------- 32=_____

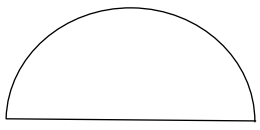
33. $\left[\dfrac{1/196}{1/94.6}\right] + [0.825]$ ---------- 33=_____

34. $\dfrac{1}{179} - \dfrac{1}{(149 + 144)}$ ---------- 34=_____

35. Lily can do the job in 4.2 hours. Laney joined her the following week and they got the job done in 2.3 hours. Calculate how long would take Laney to do the job on her own. ---------- 35=_____hrs.

36. A is 32% less than B and B is 14% less than C. Calculate what percent A is less than C. ---------- 36=_____%

SEMICIRCLE

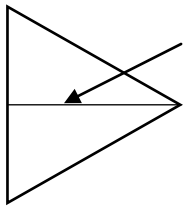


0.0057

Perimeter = ?

37=_____

EQUILATERAL TRIANGLE



Height = $1.25\text{x}10^{5}$

Area = ?

38=_____

39. $(23.7 + 53.5 + 61.9)^2(850 + 672)^2$ ---------- 39=_____

40. $\left[\frac{17000 + (1/(2.43\text{x}10^{-4}))}{(18400/15600) - 0.686}\right]^2$ ---------- 40=_____

41. $\sqrt[4]{\frac{8.24 + 9.07}{1210 - 204}}$ ---------- 41=_____

42. $\sqrt{(10.6/35.7) + 0.0574 - 0.051}$ ---------- 42=_____

43. $\sqrt{351 - 296 + 1580} - \sqrt{845}$ ---------- 43=_____

44. $\sqrt{66.9} + \sqrt{129 + 64.7} - (\pi)\sqrt{129}$ ---------- 44=_____

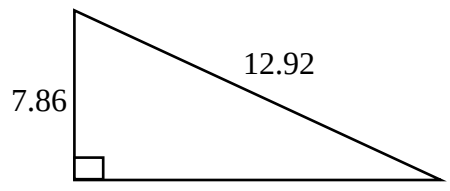
45. $\left[\sqrt[3]{(6.22/5.59)(996)}\right]^2$ ---------- 45=_____

46. $(1510)\sqrt{14900 + 6560 - 3520}$ ---------- 46=_____

47. A 10" x 10" square is folded in half seven times. After all folds are made, what is the area of the smallest folded region? ---------- 47=_____$in.^2$

48. Calculate the value of t in the following equation. Five-ninths t minus six-thirteenths equals seven-fifteenths. ---------- 48=_____

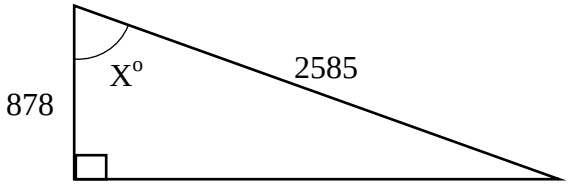
RIGHT TRIANGLE



Area = ?

49=_____

RIGHT TRIANGLE



X^o = ?

50=_____

51. $\left[\dfrac{16.3 + 36.5 + \sqrt{1260 + 1520}}{987/1310}\right]^4$ ---------- 51=_____

52. $\dfrac{\sqrt{0.704 + \pi + 1.74}}{(767 - 2420 + 1460)^2}$ ---------- 52=_____

53. $\left[\dfrac{146 - 139 + \sqrt{4580/182}}{-201 + 204}\right]^4$ ---------- 53=_____

54. $(389)(3.18\text{x}10^{7})^{1/2} - [(8.59\text{x}10^{11})(1.34\text{x}10^{13})]^{1/4}$ ---- 54=_____

55. $0.261 + \sqrt{(31.5)/(382)} - (0.284 + 0.136)^2$ ---------- 55=_____

56. $3250 + \sqrt{(881)(2550)} - (3550 + 590)$ ---------- 56=_____

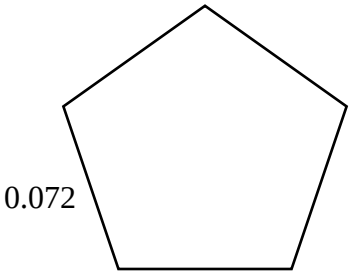
57. $\sqrt{\dfrac{(24.7)(10.8)}{(30.7) + (35.5)}} - 3.23$ ---------- 57=_____

58. $\sqrt{\dfrac{1/(763 - 709)}{(29)(475 + 257)^{-6}}}$ ---------- 58=_____

59. In 1977 a dragster fueled by Hydrogen Peroxide traveled a quarter mile in 3.22 seconds. Calculate this speed in miles per hour. --- 59=_____mph

60. R varies directly as S and inversely as the square of T. If R = 31 when S=65 and T= 4, calculate R when S = 22 and T = 1. ------ 60=_____

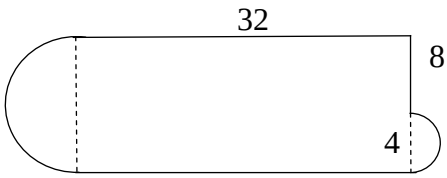
REGULAR PENTAGON



Area = ?

61=_____

POLYGON



Perimeter = ?

62=_____

63. $\frac{28! + 29!}{19!}$ ---------- 63=_____

64. (deg) $\frac{\cos(42.2°)}{1370}$ ---------- 64=_____

65. $(1.74\text{x}10^5 - 2.58\text{x}10^5)^5(7.16\text{x}10^8)$ ---------- 65=_____

66. (deg) [20]cos(110° – 77.8°) ---------- 66=_____

67. (rad) $\cos\left[\frac{(0.899)(\pi)}{(1.46)(1.87)}\right]$ ---------- 67=_____

68. (rad) (3.54)tan(11.6) ---------- 68=_____

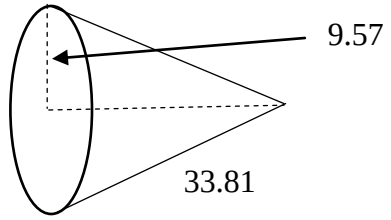
69. (rad) cos[(0.42 – 0.126)(28.5)] ---------- 69=_____

70. $(16.4 - 5.48 + 8.98)^{5/3}$ ---------- 70=_____

71. Calculate the probability of drawing a black king from a standard deck of cards. ---------- 71=_____

72. Calculate the number of different 10-digit numbers that can be created from the digits 0 thru 9 inclusive. Repetition is allowed. ---------- 72=_____

CONE

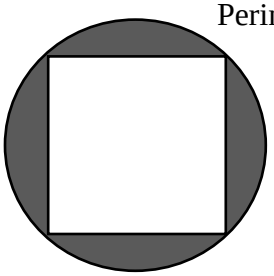


Volume = ?

73=_____

CIRCLE WITH INSCRIBED SQUARE

Perimeter of Square = 47.8



Shaded Area = ?

74=_____

75. $\text{Ln}\left[\frac{173 + 66.9 + 222}{37.6 + 165 - 103}\right]$ ---------- 75=_____

76. $\frac{0.0125 + \sqrt{(0.0188)(0.028)} + (0.0639)(0.156)}{\sqrt{\sqrt{0.692 + 0.567}}}$ ---------- 76=_____

77. $\text{Log}(125 + 88.6 + 81.5)$ ---------- 77=_____

78. $\frac{\text{Log}[1.15 + (1.85)(\pi)]}{0.341 + \text{Log}[1230 + 601]}$ ---------- 78=_____

79. $2 + 4 + 6 + \ldots + 248$ ---------- 79=_____

80. $1 + \frac{(0.56)^4}{2} - \frac{(0.56)^6}{6} + \frac{(0.56)^8}{24} - \frac{(0.56)^{10}}{120}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #2 Answer Key

Page 1

1 = -1670
= -1.67×10^{3}

2 = 88.0
= 8.80×10^{1}

3 = 4070
= 4.07×10^{3}

4 = -9.86
= -9.86×10^{0}

5 = 28.0
= 2.80×10^{1}

6 = -265
= -2.65×10^{2}

7 = -0.290
= -2.90×10^{-1}

8 = 0.812
= 8.12×10^{-1}

9 = 4.94×10^{6}

10 = 3.94×10^{12}

11 = 12.9
= 1.29×10^{1}

12 = 3.18
= 3.18×10^{0}

13 = 83.0
= 8.30×10^{1}

Page 2

14 = 8.24×10^{9}

15 = 72.2
= 7.22×10^{1}

16 = -10800
= -1.08×10^{4}

17 = 2.66
= 2.66×10^{0}

18 = 332
= 3.32×10^{2}

19 = -9.82
= -9.82×10^{0}

20 = 0.0334
= 3.34×10^{-2}

21 = 0.00828
= 8.28×10^{-3}

22 = 3.28
= 3.28×10^{0}

23 = -4110
= -4.11×10^{3}

24 = 1800
= 1.80×10^{3}

25 = 1005 INT.

26 = 96.8
= 9.68×10^{1}

Page 3

27 = -1.41×10^{12}

28 = 0.802
= 8.02×10^{-1}

29 = 6.15×10^{-14}

30 = 0.00860
= 8.60×10^{-3}

31 = -0.0371
= -3.71×10^{-2}

32 = 3.44×10^{-11}

33 = 1.31
= 1.31×10^{0}

34 = 0.00217
= 2.17×10^{-3}

35 = 5.08
= 5.08×10^{0}

36 = 41.5
= 4.15×10^{1}

37 = 0.0147
= 1.47×10^{-2}

38 = 9.02×10^{9}

Page 4

39 = 4.48×10^{10}

40 = 1.83×10^{9}

41 = 0.362
= 3.62×10^{-1}

42 = 0.551
= 5.51×10^{-1}

43 = 11.4
= 1.14×10^{1}

44 = -13.6
= -1.36×10^{1}

45 = 107
= 1.07×10^{2}

46 = 202000
= 2.02×10^{5}

47 = 0.781
= 7.81×10^{-1}

48 = 1.67
= 1.67×10^{0}

49 = 40.3
= 4.03×10^{1}

50 = 70.1
= 7.01×10^{1}

2019-2020 TMSCA Middle School Calculator Test #2 Answer Key

Page 5

51 = 3.85×10^{8}

52 = 6.34×10^{-5}

53 = 257
= 2.57×10^{2}

54 = 352000
= 3.52×10^{5}

55 = 0.372
= 3.72×10^{-1}

56 = 609
= 6.09×10^{2}

57 = -1.22
= -1.22×10^{0}

58 = 9.91×10^{6}

59 = 280
= 2.80×10^{2}

60 = 168
= 1.68×10^{2}

Page 6

61 = 0.00892
= 8.92×10^{-3}

62 = 97.1
= 9.71×10^{1}

63 = 7.52×10^{13}

64 = 0.000541
= 5.41×10^{-4}

65 = -2.99×10^{33}

66 = 16.9
= 1.69×10^{1}

67 = 0.511
= 5.11×10^{-1}

68 = -5.13
= -5.13×10^{0}

69 = -0.501
= -5.01×10^{-1}

70 = 146
= 1.46×10^{2}

71 = 0.0385
= 3.85×10^{-2}

72 = 1.00×10^{10}

Page 7

73 = 3110
= 3.11×10^{3}

74 = 81.5
= 8.15×10^{1}

75 = 1.53
= 1.53×10^{0}

76 = 0.0429
= 4.29×10^{-2}

77 = 2.47
= 2.47×10^{0}

78 = 0.234
= 2.34×10^{-1}

79 = 15500
= 1.55×10^{4}

80 = 1.04
= 1.04×10^{0}

TMSCA 19-20 MS CA Test #2 Solutions to Word and Geometry Problems

11. $\frac{2+3+5+7+11+13+17+19+23+29}{10}$

12. A = πr^2 so $r = \sqrt{\frac{31.8}{\pi}}$

13. On HP RPN calculator, enter 5000. Then 852 %chg. You don't need the negative on the answer since the wording of the problem (percent decrease) implies the negative.
OR: $\frac{5000-852}{5000} = \frac{x}{100}$;
$x = \frac{100(5000-852)}{5000}$

24. 640 acres in one mi.^{2}
640(2.81)

25. $\frac{3009}{3}$ = 1003 =middle integer. The next odd integer is 1005.

26. $\frac{850-5-3-4-2-13}{850} = \frac{x}{100}$

$x = \frac{100(850-27)}{850}$

35. $\frac{xy}{x+y} = \frac{4.2y}{4.2+y} = 2.3$

$4.2y = 2.3(4.2+y)$
$y = \frac{9.66}{1.9}$

36. B = .86C; A = .68B so
A = .68(.86C)
A = .585C
1-.585 = .415.
Multiply by 100 to change to a percent

37. $\pi r + d$
$\pi\left(\frac{.0057}{2}\right) + .0057$

38. $A = \frac{h^2\sqrt{3}}{3} = \frac{(1.25\ x\ 10^5)^2\sqrt{3}}{3}$

47. $\frac{10\ x\ 10}{2^7}$

48. $\frac{5}{9}t - \frac{6}{13} = \frac{7}{15}$

$t = \frac{\frac{7}{15} + \frac{6}{13}}{\frac{5}{9}}$

49. Base = $\sqrt{12.92^2 - 7.86^2}$

Area = $\frac{base\ (7.86)}{2}$

50. $\frac{cos\ x}{1} = \frac{878}{2585}$

$x = \text{acos}\left(\frac{878}{2585}\right)$

59. 1 miles in 3.22(4) = 12.88 seconds.
$\frac{1\ mile}{12.88\ secs} \cdot \frac{3600\ secs}{1\ hour}$

60. $\frac{R_1(T_1)^2}{S_1} = \frac{R_2(T_2)^2}{S_2}$

$\frac{31(4^2)}{65} = \frac{R\ (1)}{22}$

$R = \frac{4^2(31)(22)}{65}$

61. A = $\frac{\boldsymbol{Perimeter^2}}{\left(\boldsymbol{tan}\frac{\boldsymbol{180}}{\boldsymbol{n}}\right)(\boldsymbol{4n})}$

$\frac{[.\boldsymbol{072(5)}]^{\boldsymbol{2}}}{\left(\boldsymbol{tan}\ \frac{\boldsymbol{180}}{\boldsymbol{5}}\right)(\boldsymbol{20})}$

62. Perimeter = $32(2) + \left(\frac{8+4}{2}\right)\pi + 8 + \left(\frac{4}{2}\right)\pi$

71. $\frac{2}{52}$

72. 10^{10}

73. height: $\sqrt{33.81^2 - 9.57^2}$

$V = \frac{1}{3}\pi(9.57)^2 h$

74. Side of square: $\frac{47.8}{4}$
Diameter = diagonal = $\left(\frac{47.8}{4}\right)\sqrt{2}$; radius = $\frac{\left(\frac{47.8}{4}\right)\sqrt{2}}{2}$

$A = \pi\left[\frac{\left(\frac{47.8}{4}\right)\sqrt{2}}{2}\right]^2 - \left(\frac{47.8}{4}\right)^2$