8

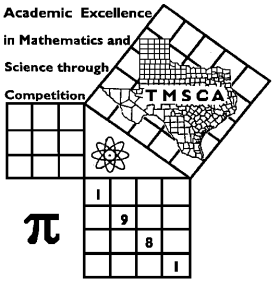
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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#3©

OCTOBER 31, 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.

2020 – 2021 TMSCA Middle School Calculator Test #3

1. $-1600 - 1080$ ---------- 1=_____

2. $-29 - 12 - 29$ ---------- 2=_____

3. $826 + 962 + 613$ ---------- 3=_____

4. $\pi - 25 - 3 - 14$ ---------- 4=_____

5. $-232 - 78 - 205 - 27$ ---------- 5=_____

6. $50.3 + 258 - 162 - 98.1 + 209$ ---------- 6=_____

7. $(0.928 + 0.876 - \pi) - (1.23 + 1.7)$ ---------- 7=_____

8. $0.792 + 0.799 - 0.382 + 0.598 + 0.413$ ---------- 8=_____

9. $390 \times 148 \times 366$ ---------- 9=_____

10. $56.3 \times 26.6 \times 887 \times 1260$ ---------- 10=_____

11. The McMillan TAC-50 rifle fires a bullet at 2,700 feet per second. Calculate this speed in miles per hour. ---------- 11=_____mph

12. The height of people in Adams' family are 6'2", 5'11", 5'7", 5'2", 4'2", and 3'5". Calculate the range of these heights in inches. --- 12=_____in.

13. Eight hundred twenty-four is 33% of what number? ---------- 13=_____

14. $(474)[321 \times 172 \times 86]$ ---------- 14=_____

15. $25 - [118/17 + 18.4]$ ---------- 15=_____

16. $\{-69/155\}\left[\frac{136}{56 + 191}\right]$ ---------- 16=_____

17. $\left[\frac{-123}{148}\right][(50/131) - 0.0431]$ ---------- 17=_____

18. $\left[\frac{44/230}{144/87}\right]\{0.161 + 0.138 - 0.0698\}$ ---------- 18=_____

19. $\left[\frac{(0.0199 + 0.014)}{173/239}\right]\left[\frac{0.00942}{0.0141}\right]$ ---------- 19=_____

20. $(0.00326)[134/97 \times 127/49] - 0.00863$ ---------- 20=_____

21. $\frac{(\pi)(9/7)(16/4)}{66}$ ---------- 21=_____

22. $\frac{(0.252 + 1.21 - 1.71)}{\{(5.43 - 1.39)/(4.36 \times 10^{-4})\}}$ ---------- 22=_____

23. $\frac{[-(2170 + 2180)(2980 - 2950)]}{(20.3/(40700))}$ ---------- 23=_____

24. Bethany filled the gas tank of her car. When she finished, she noticed the number of gallons was 34.892 gallons and the total cost was \$59.98. Calculate the price per gallon. ---------- 24=\$_____

25. There are two right angles and one angle that measures 23.8^{o} in a trapezoid. Calculate the measure of the fourth angle in degrees. ---------- 25=_____^{o}

26. Calculate the number of distinct diagonals in a polygon that has fifty-eight sides. ---------- 26=_____INT.

27. $(0.343)[(0.00205/0.00226)(307 + 272)]$ ---------- 27=_____

28. $\dfrac{(0.246 - 0.418)(0.00115 + 0.00647)}{(4.05\text{x}10^{11})}$ ---------- 28=_____

29. $(2.37)[[8.63/(30.5)][729/(715)]]$ ---------- 29=_____

30. $\dfrac{1}{0.0144} + \dfrac{1}{(0.0943 - 0.073)}$ ---------- 30=_____

31. $[1.11]\left[\dfrac{1/70.9}{1/(69.9)}\right]$ ---------- 31=_____

32. $(0.156)\left[\dfrac{43.3}{(5.69\text{x}10^{9})}\right]$ ---------- 32=_____

33. $\left[\dfrac{1/1300}{1/1300}\right][1.36\text{x}10^{6}]$ ---------- 33=_____

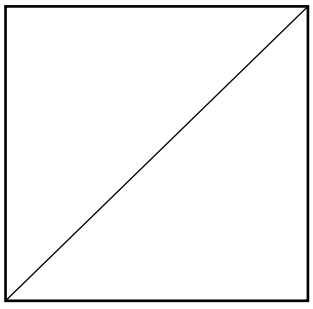
34. $\dfrac{1}{591} - \dfrac{1}{1290} + \dfrac{1}{1480}$ ---------- 34=_____

35. Calculate the additive inverse of the multiplicative inverse of e^5. 35=_____

36. The population of Mathropolis went from 57,652 to 45,798.
Calculate the percent change in the population. ---------- 36=_____%

37.

SQUARE



Area = $1.26\text{x}10^5$

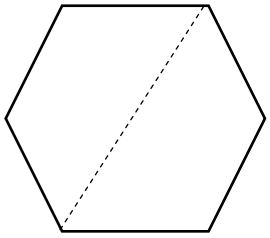
Diagonal = ?

37=_____

38.

REGULAR HEXAGON

Perimeter = $7.93\text{x}10^7$



Diagonal = ?

38=_____

39. $\sqrt{\frac{1380 + 1490}{13.9 - 12.9}}$ ---------- 39=_____

40. $\frac{(9600 + 33500)^2}{(0.512 - 0.0612)^3}$ ---------- 40=_____

41. $(11.9 + 8.81)^2(465 + 213)^2$ ---------- 41=_____

42. $(1/\pi)\sqrt[3]{\frac{3.92 + 4.75}{6.87 - 2.83}}$ ---------- 42=_____

43. $(172)\sqrt{14900 + 8570 + 8450}$ ---------- 43=_____

44. $\sqrt{161} + \sqrt{182 + 311} - (\pi)\sqrt{585}$ ---------- 44=_____

45. $\left[\sqrt{(383/383)(0.447)}\right]^3$ ---------- 45=_____

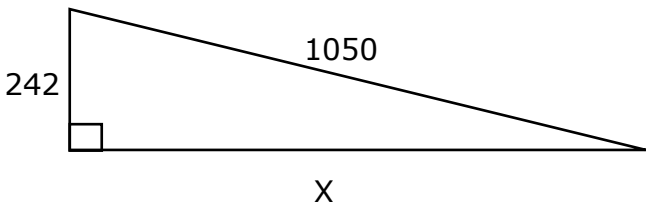
46. $\frac{1}{\sqrt{227 + 271 + 277}} + \left(\frac{1}{\sqrt{6.67}}\right)^3$ ---------- 46=_____

47. The sum of two integers is eighty-five. Their difference is negative three hundred fifty-nine. Calculate the smaller of the integers. 47=_____INT.

48. Calculate the slope of the line given by the equation
15x – 8y = 20 ---------- 48=_____

49.

RIGHT TRIANGLE

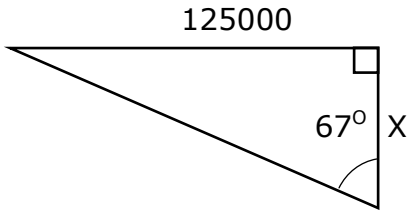


X = ?

49=_____

50.

RIGHT TRIANGLE



X = ?

50=_____

51. $\sqrt{\frac{3.06\text{x}10^{5}}{(0.261)(13.1)} + \frac{(49.6 - 69.6)}{(0.0219 + 0.0293)}}$ ---------- 51=_____

52. $\left[\frac{11.3 + 2.61 + \sqrt{51.1 + 113}}{9940/22800}\right]^{4}$ ---------- 52=_____

53. $\left[\frac{\sqrt{\sqrt{21.5 - 2.91}}}{-(49400 - 1.02\text{x}10^{5})}\right]^{3}[57.9 + 99.6]$ ---------- 53=_____

54. $1820 + \sqrt{(821)(1540)} - (2530 + 2440)$ ---------- 54=_____

55. $(848)(2.12\text{x}10^{7})^{1/4} - [(2.92\text{x}10^{9})(3.60\text{x}10^{9})]^{1/4}$ ------- 55=_____

56. $(1.58)^{2}\sqrt{(0.201)/(44.3)} - (0.0993 + 0.0288)$ ---------- 56=_____

57. $(\text{rad})\tan(33.9) + (11.9/29.5)$ ---------- 57=_____

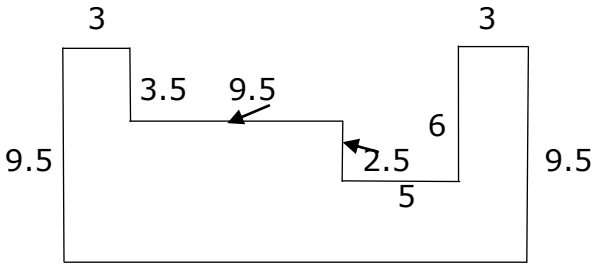
58. $\sqrt{\frac{(11.4)(2.5)}{(37.9) + (38.4)}} - 0.895$ ---------- 58=_____

59. The diameter of a sphere is $5.62\text{x}10^{6}$ feet. Calculate the surface area of the sphere in square feet. ---------- 59=_____ft.^{2}

60. Calculate the probability of rolling a sum of nine on a standard pair of dice. ---------- 60=_____

61.

POLYGON

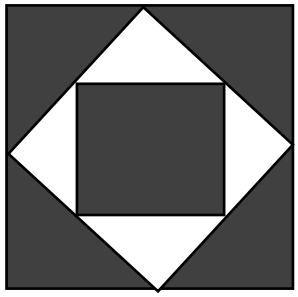


Area = ?

61=_____

62.

SQUARES



Perimeter of medium square = 728

Shaded Area = ?

62=_____

63. $\frac{3!}{30!}$ ---------- 63=_____

64. $(4.64\text{x}10^{8} - 1.73\text{x}10^{9})^{-4}(1.61\text{x}10^{9})$ ---------- 64=_____

65. $(10 - \pi)e^{0.441}$ ---------- 65=_____

66. (deg) $\sin(22.5° - 31.4°) + 0.13$ ---------- 66=_____

67. (rad) $\tan\left[\frac{(190)(\pi)}{(75.4)(103)}\right]$ ---------- 67=_____

68. (deg) $\frac{\sin(4.6°)}{183 + 1360}$ ---------- 68=_____

69. (deg) $\frac{\sin(31.7°)}{\tan(31.7°)}[3.03]$ ---------- 69=_____

70. $(17.6 + 7.83 + 16.6)^{2/5}$ ---------- 70=_____

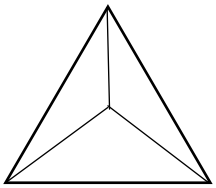
71. Calculate the 54^{th} triangular number. ---------- 71=_____INT.

72. A boat is rowed down a 7 mile stretch of the river with the current in two hours. The return trip up the same 7 mile stretch of the river is rowed against the current takes five hours. Calculate the speed of the current of the river. ---------- 72=_____mph

73.

TETRAHEDRON

Edge = 54.7

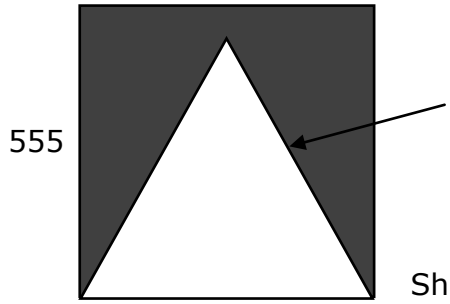


Surface Area = ?

73=_____

74.

ISOSCELES TRIANGLE AND SQUARE



Shaded Area = ?

74=_____

75. $\dfrac{1.24 + \sqrt{(2.14)(2.81)} + (0.121)(1.19)}{\sqrt{\sqrt{0.00964 + 0.00512}}}$ ---------- 75=_____

76. $\text{Ln}\left[\dfrac{503 + 513 + 113}{146 + 75.2 - 58.7}\right]$ ---------- 76=_____

77. $\dfrac{2010 - 936}{\text{Log}(134 + 258)}$ ---------- 77=_____

78. $(103)^{\pi}(7.33)^{5}(18.6 - 9.59)^{2}$ ---------- 78=_____

79. $1 + 2 + 3 + \ldots + 376$ ---------- 79=_____

80. $1 + (0.98) + \dfrac{(0.98)^2}{2} + \dfrac{(0.98)^3}{6} + \dfrac{(0.98)^4}{24}$ ---------- 80=_____

2020 – 2021 TMSCA Middle School Calculator Test 3 Answer Key

Page 1

1 = -2680
= -2.68×10^{3}

2 = -70.0
= -7.00×10^{1}

3 = 2400
= 2.40×10^{3}

4 = -38.9
= -3.89×10^{1}

5 = -542
= -5.42×10^{2}

6 = 257
= 2.57×10^{2}

7 = -4.27
= -4.27×10^{0}

8 = 2.22
= 2.22×10^{0}

9 = 2.11×10^{7}

10 = 1.67×10^{9}

11 = 1840
= 1.84×10^{3}

12 = 33.0
= 3.30×10^{1}

13 = 2500
= 2.50×10^{3}

Page 2

14 = 2.25×10^{9}

15 = -0.341
= -3.41×10^{-1}

16 = -0.245
= -2.45×10^{-1}

17 = -0.281
= -2.81×10^{-1}

18 = 0.0265
= 2.65×10^{-2}

19 = 0.0313
= 3.13×10^{-2}

20 = 0.00304
= 3.04×10^{-3}

21 = 0.245
= 2.45×10^{-1}

22 = -2.68×10^{-5}

23 = -2.62×10^{8}

24 = $1.72

25 = 156
= 1.56×10^{2}

26 = 1595 INT.

Page 3

27 = 180
= 1.80×10^{2}

28 = -3.24×10^{-15}

29 = 0.684
= 6.84×10^{-1}

30 = 116
= 1.16×10^{2}

31 = 1.09
= 1.09×10^{0}

32 = 1.19×10^{-9}

33 = 1.36×10^{6}

34 = 0.00159
= 1.59×10^{-3}

35 = -0.00674
= -6.74×10^{-3}

36 = -20.6
= -2.06×10^{1}

37 = 502
= 5.02×10^{2}

38 = 2.64×10^{7}

Page 4

39 = 53.6
= 5.36×10^{1}

40 = 2.03×10^{10}

41 = 1.97×10^{8}

42 = 0.411
= 4.11×10^{-1}

43 = 30700
= 3.07×10^{4}

44 = -41.1
= -4.11×10^{1}

45 = 0.299
= 2.99×10^{-1}

46 = 0.0940
= 9.40×10^{-2}

47 = -137 INT.

48 = 1.88
= 1.88×10^{0}

49 = 1020
= 1.02×10^{3}

50 = 53100
= 5.31×10^{4}

2020 – 2021 TMSCA Middle School Calculator Test 3 Answer Key

Page 5

51 = -91.5
= -9.15×10^{1}

52 = 1.41×10^{7}

53 = 9.69×10^{-12}

54 = -2030
= -2.03×10^{3}

55 = 601
= 6.01×10^{2}

56 = 0.0401
= 4.01×10^{-2}

57 = -0.369
= -3.69×10^{-1}

58 = -0.284
= -2.84×10^{-1}

59 = 9.92×10^{13}

60 = 0.111
= 1.11×10^{-1}

Page 6

61 = 132
= 1.32×10^{2}

62 = 49700
= 4.97×10^{4}

63 = 2.26×10^{-32}

64 = 6.27×10^{-28}

65 = 10.7
= 1.07×10^{1}

66 = -0.0247
= -2.47×10^{-2}

67 = 0.0770
= 7.70×10^{-2}

68 = 5.20×10^{-5}

69 = 2.58
= 2.58×10^{0}

70 = 4.46
= 4.46×10^{0}

71 = 1485 INT.

72 = 1.05
= 1.05×10^{0}

Page 7

73 = 5180
= 5.18×10^{3}

74 = 171000
= 1.71×10^{5}

75 = 11.0
= 1.10×10^{1}

76 = 1.94
= 1.94×10^{0}

77 = 414
= 4.14×10^{2}

78 = 3.62×10^{12}

79 = 70900
= 7.09×10^{4}

80 = 2.66
= 2.66×10^{0}

TMSCA 2020-2021 MS CA Test 3 Solutions to Word and Geometry Problems

11. 15 mph = 22 feet/sec

$\frac{2700}{x} = \frac{22}{15}$; $x = \frac{2700(15)}{22}$

12. Changing to inches

74,71,67,62,50,41

Range = 74 – 41

13. $\frac{824}{x} = \frac{33}{100}$; $x = \frac{824(100)}{33}$

24. $\frac{59.98}{34.892}$

25. Total degrees in a quadrilateral = 360

360 – 2(90) – 23.8

26. $\frac{n(n-3)}{2} = \frac{58(58-3)}{2}$

35. $-\left(\frac{1}{e^5}\right)$

36. On HP RPN: 57652 enter, then 45798, then punch the % chg key

Without RPN,

$\left(\frac{45798-57652}{57652}\right)100$

37. A = $\frac{d^2}{2}$; $1.26\,x\,10^5 = \frac{d^2}{2}$

$= \sqrt{(1.26\,x\,10^5\ )2}$

38. On a hexagon the diagonal = 1/3 of the perimeter. $\frac{7.93\,x\,10^7}{3}$

47. $\begin{Bmatrix} x+y=85 \\ x-y=359 \end{Bmatrix}$

$\begin{Bmatrix} x+y=85 \\ -x+y=-359 \end{Bmatrix}$

$2y = -274$

$y = -137$

48. slope of $ax + by = c$ is $\frac{-a}{b} = \frac{-15}{-8}$

49. $\sqrt{(1050)^2 - (242)^2}$

50. $\frac{tan\ 67}{1} = \frac{125000}{x}$

$x = \frac{125000}{\tan 67}$

59. SA = $4\pi r^2$; $r = \frac{5.62\,x\,10^6}{2}$

SA = $4\pi\left(\frac{5.62\,x\,10^6}{2}\right)^2$

60. There are 4 ways to roll a 9; 36 possible rolls. Prob = $\frac{4}{36}$

61. Completing the rectangle across the top =

$9.5(3 + 9.5 + 5 + 3)$

Polygon area = rectangle minus two other rectangles.

$9.5(3 + 9.5 + 5 + 3)$ – (3.5)(9.5) – 6(5)

62. Perimeter of medium square = 728. One side = $\frac{728}{4} = 182$. Area of one white triangle = $\frac{182^2}{8}$

Medium square = 8 triangles = 33124. White medium

62. square = 4 triangles. Gray shaded area = 12 triangles.

$\frac{8}{33124} = \frac{12}{x}$

71. $\frac{54(55)}{2}$

72. Use $rt = d$

	Rate	time	dist
Up	B-c	5	5(B-c)
Down	B+c	2	2(B+c)

$\begin{Bmatrix} 5(b-c)=7 \\ 2(b+c)=7 \end{Bmatrix}$

$\begin{Bmatrix} b-c=\frac{7}{5} \\ b+c=\frac{7}{2} \end{Bmatrix}$

$\begin{Bmatrix} b-c=\frac{7}{5} \\ -b-c=-\frac{7}{2} \end{Bmatrix}$

$-2c = \frac{7}{5} - \frac{7}{2}$; $c = \frac{\frac{7}{5}-\frac{7}{2}}{-2}$

73. 4 equilateral triangles

$4\left[\frac{side^2\sqrt{3}}{4}\right] = side^2\sqrt{3} =$

$54.7^2\sqrt{3}$

74. ht. of isosceles triangle =

ht. = $\sqrt{566.1^2 - \left(\frac{555}{2}\right)^2}$

Area of triangle: $\frac{1}{2}(555)(ht.)$

Shaded area:

$555^2 - \frac{1}{2}(555)(ht.)$

79. $\frac{376(377)}{2}$