8

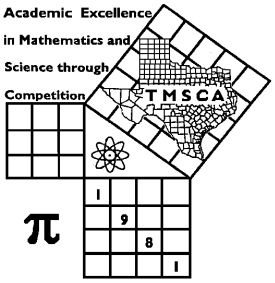
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



TMSCA MIDDLE SCHOOL

CALCULATOR

TEST #3 ©

NOVEMBER 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*, $1.23x10^{0}$*, $1.23x10^{1}$, $1.23x10^{01}$, .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.

2017-2018 TMSCA Middle School Calculator Test 3

1. 2710 + 5900 ---------- 1=_____

2. 18 – 56 – 15 ---------- 2=_____

3. 222 + 125 + 245 ---------- 3=_____

4. 21 – 14 + 19 – 50 ---------- 4=_____

5. 224 – 124 – 185 + 173 ---------- 5=_____

6. 24.6 + 98.6 – 74.6 – 186 – 99.9 ---------- 6=_____

7. (1.59 + 0.614 – 0.64) – (π + 0.991) ---------- 7=_____

8. 1.28 – 0.919 + 0.504 – 1.16 – 0.416 ---------- 8=_____

9. 352 x 320 x 27.2 ---------- 9=_____

10. 169 x 56.5 x 84.4 x 44.4 ---------- 10=_____

11. Jims' BB gun fires BBs at 2.23×10^2 feet per second. Bullets from Mattis' M16 travel at 3.30×10^3 feet per second. Calculate the positive difference between these two speeds. ---------- 11=_____ft./sec.

12. The five wettest places on Earth receive 467, 411, 463, 464, and 453 inches of rain per year. Calculate the range of these inches of rainfall. ---------- 12=_____in.

13. What percent of a million is ten? ---------- 13=_____%

14. (80/175)[132 – 108] ---------- 14=_____

15. 72/[248 x 167 x 152] ---------- 15=_____

16. $\{-352/191\}\left[\frac{570}{430 + 307}\right]$ ---------- 16=_____

17. $\left[\frac{72}{194}\right][(219/230) + 0.483]$ ---------- 17=_____

18. $\frac{[0.0117/(0.0081)]/3.65}{(74.1 \times 56)(0.0379)}$ ---------- 18=_____

19. $\left[\frac{(167 + 130)}{96/73}\right]\left[\frac{0.0195}{0.00456}\right]$ ---------- 19=_____

20. $\frac{(\pi)(4/4)(9/8)}{120}$ ---------- 20=_____

21. (0.17)[17/71 x 91/36] – 0.0457 ---------- 21=_____

22. $\frac{[-(910 + 5340)(8660 - 2780)]}{(0.547/(387))}$ ---------- 22=_____

23. $\frac{(2620 \times 3320)/4740}{(4390 \times 0.0986) + 296}$ ---------- 23=_____

24. At the gas pump, the number of gallons reads 21.672 and the total cost reads $47.36. Calculate the price per gallon. ---------- 24=$_____

25. One of the angles in an isosceles triangle measures 105.21°. Calculate the measure of one of the other angles in degrees. ---- 25=_____°

26. Two angles are supplementary. One measures one-sixth of the other. Calculate the measure of the smallest angle in degrees. ---------- 26=_____°

27. $\dfrac{(0.0127 - 0.0202)(\pi + 3.14)}{(1.04\text{x}10^{12})}$ ---------- 27=_____

28. $(482)\left[(37.1/34.7)(0.00144 + 5.20\text{x}10^{-4})\right]$ ---------- 28=_____

29. $\dfrac{(1.05\text{x}10^{6}) + (5.59\text{x}10^{5})}{(-4.88)(\pi) - 2.37}$ ---------- 29=_____

30. $(11.4)\left[(3.75\text{x}10^{12}) - (5.86\text{x}10^{12})\right]$ ---------- 30=_____

31. $\dfrac{1}{-1120} + \dfrac{1}{(670 - 1540)}$ ---------- 31=_____

32. $(0.00642)\left[\dfrac{74.8}{(6.79\text{x}10^{-10})}\right]$ ---------- 32=_____

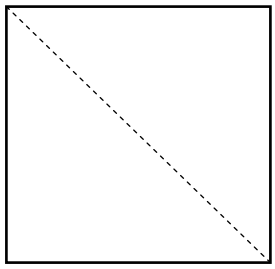
33. $\left[\dfrac{1/645}{1/603}\right] + [0.271]$ ---------- 33=_____

34. $\dfrac{1}{675} - \dfrac{1}{101} + \dfrac{1}{109}$ ---------- 34=_____

35. Calculate the reciprocal of the cubed root of ten to the fiftieth power. ---------- 35=_____

36. The size of a Poofla decreased from one hundred thousand to eight hundred fifty. Calculate the percent decrease. ---------- 36=_____%

SQUARE

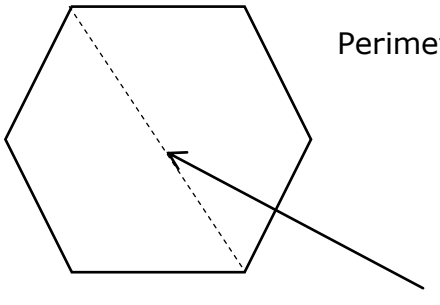


Perimeter = 8223

Diagonal = ?

37=_____

REGULAR HEXAGON



Perimeter = 500100

= ?

38=_____

39. $(0.0817 + 0.13)^2(0.207 + 0.161)^2$ ---------- 39=_____

40. $\left[\frac{5.9}{1.6}\right](4.13 + 4.83)^4$ ---------- 40=_____

41. $\left[\frac{367 + (1/(0.002))}{(1780/949) - 1.09}\right]^2$ ---------- 41=_____

42. $\sqrt{2150 - 478 + 3610} - \sqrt{3060}$ ---------- 42=_____

43. $(1/\pi)\sqrt[3]{\frac{0.0683 + 0.0638}{6.93 - 3.37}}$ ---------- 43=_____

44. $\sqrt{28.5} + \sqrt{38.2 + 5.83} - (\pi)\sqrt{35.9}$ ---------- 44=_____

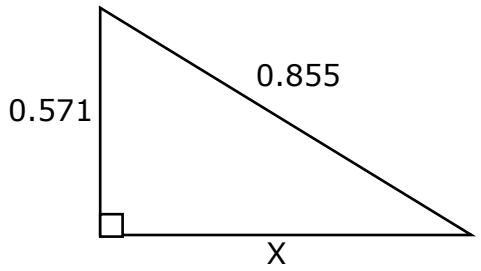
45. $\sqrt[4]{0.676 - 603/1060} + 1/\sqrt{2230 + 6720}$ ---------- 45=_____

46. $\frac{(301 + 44.8)^{1/4}}{(577 - 78.8)^{1/2}}$ ---------- 46=_____

47. The sum of two positive integers is 729. Their difference is 85.
Calculate the value of the smaller integer. ---------- 47=_____INT.

48. Calculate the slope of the line given by the equation $6x - 5y = 7$. 48=_____

RIGHT TRIANGLE

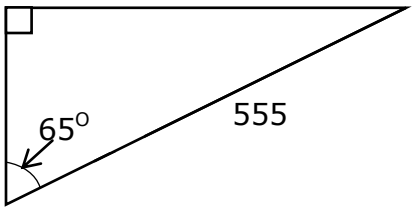


X = ?

49=_____

RIGHT TRIANGLE

X



X = ?

50=_____

51. $\dfrac{(1.27\text{x}10^{5} + 1.10\text{x}10^{5} - 61900)^{2}}{\sqrt{16.2 + 3.97 + 20.1}}$ ---------- 51=_____

52. $\left[\dfrac{41000 + 9500 + \sqrt{2.47\text{x}10^{9} + 2.34\text{x}10^{9}}}{596/751}\right]^{3}$ ---------- 52=_____

53. $\left[\dfrac{\sqrt{\sqrt{5230 - 1190}}}{-(0.886 - 0.695)}\right]^{2}[0.142 + 0.101]$ ---------- 53=_____

54. $\sqrt{\dfrac{(2080)(21000)}{(3630)(1.54\text{x}10^{5})}} - 0.0364 + 0.273$ ---------- 54=_____

55. $(1.11)^{2}\sqrt{(35)/(93)} - (0.558 + 0.331)$ ---------- 55=_____

56. $0.0984 + \sqrt{(220)/(5290)} - (0.165 + 0.128)^{2}$ ---------- 56=_____

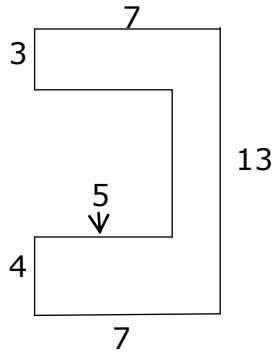
57. (rad) sin(45.8) + (50.6/8.39) ---------- 57=_____

58. $\sqrt{\dfrac{(328)(2450)}{(577) + (189)}} - 81.7$ ---------- 58=_____

59. The diameter of a sphere is 83.2 feet. Calculate the surface area of the sphere in square feet. ---------- 59=_____ $ft.^{2}$

60. Calculate the probability of rolling a sum of 5 on a standard pair of dice. ---------- 60=_____

POLYGON

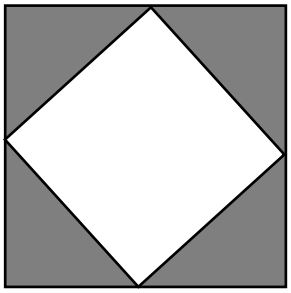


All angles are right angles

Area = ?

61=_____

SQUARES



Edge of small square = 2521

Shaded Area = ?

62=_____

63. $\frac{27!/15!}{12! + 11!}$ ---------- 63=_____

64. (deg) $\frac{\cos(1.03°)}{163}$ ---------- 64=_____

65. (deg) $[(450)\cos(19.5^{o})]$ ---------- 65=_____

66. (deg) $\sin(17.7° - 18.2°) + 0.00409$ ---------- 66=_____

67. (deg) $(5560 - 2600)\sin(20.5°) + 756$ ---------- 67=_____

68. (rad) $(1.28)\cos(10)$ ---------- 68=_____

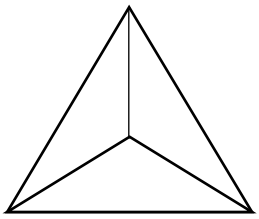
69. (deg) $\frac{\sin(39.9°)}{\tan(39.9°)}[82.3]$ ---------- 69=_____

70. $(222 - 213)^{0.112 - 0.205}$ ---------- 70=_____

71. Calculate the 31st triangular number. ---------- 71=_____INT.

72. Chuck rides his bike 27 miles in 4 hours against the wind. He turns around and returns the same 27 miles in 3.23 hours with the wind. Calculate the rate of the wind. ---------- 72=_____mph.

TETRAHEDRON

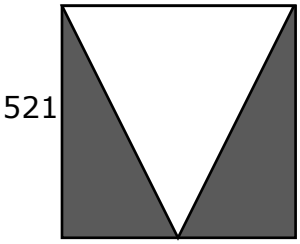


Edge = 27

Surface Area = ?

73=_____

ISOSCELES TRIANGLE AND SQUARE



Shaded Area = ?

74=_____

75. $\frac{\text{Log}(833 + 574)}{790 - 2940}$ ---------- 75=_____

76. $\frac{0.025 + \sqrt{(0.0831)(0.0677)} + (0.0582)(0.384)}{\sqrt{\sqrt{19.3 + 7.88}}}$ ---------- 76=_____

77. $(10100)10^{(0.748)(4.42)}$ ---------- 77=_____

78. $\text{Ln}\left[\frac{74.5 + 66.2 + 30.9}{59.2 - 24.6 - 31.9}\right]$ ---------- 78=_____

79. $1 + 3 + 5 + \ldots + 975$ ---------- 79=_____

80. $-\frac{1}{(9.3)} + \frac{1}{3(9.3)^3} - \frac{1}{5(9.3)^5} + \frac{1}{7(9.3)^7}$ ---------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 3 Answer Key

Page 1

1 = 8610
= 8.61×10^{3}

2 = -53.0
= -5.30×10^{1}

3 = 592
= 5.92×10^{2}

4 = -24.0
= -2.40×10^{1}

5 = 88.0
= 8.80×10^{1}

6 = -237
= -2.37×10^{2}

7 = -2.57
= -2.57×10^{0}

8 = -0.711
= -7.11×10^{-1}

9 = 3.06×10^{6}

10 = 3.58×10^{7}

11 = 3080
= 3.08×10^{3}

12 = 56.0
= 5.60×10^{1}

13 = 0.00100
= 1.00×10^{-3}

Page 2

14 = 11.0
= 1.10×10^{1}

15 = 1.14×10^{-5}

16 = -1.43
= -1.43×10^{0}

17 = 0.533
= 5.33×10^{-1}

18 = 0.00252
= 2.52×10^{-3}

19 = 966
= 9.66×10^{2}

20 = 0.0295
= 2.95×10^{-2}

21 = 0.0572
= 5.72×10^{-2}

22 = -2.60×10^{10}

23 = 2.52
= 2.52×10^{0}

24 = $2.19

25 = 37.4
= 3.74×10^{1}

26 = 25.7
= 2.57×10^{1}

Page 3

27 = -4.53×10^{-14}

28 = 1.01
= 1.01×10^{0}

29 = -90900
= -9.09×10^{4}

30 = -2.41×10^{13}

31 = -0.00204
= -2.04×10^{-3}

32 = 7.07×10^{8}

33 = 1.21
= 1.21×10^{0}

34 = 0.000755
= 7.55×10^{-4}

35 = 2.15×10^{-17}

36 = 99.2
= 9.92×10^{1}

37 = 2910
= 2.91×10^{3}

38 = 167000
= 1.67×10^{5}

Page 4

39 = 0.00607
= 6.07×10^{-3}

40 = 23800
= 2.38×10^{4}

41 = 1.22×10^{6}

42 = 17.4
= 1.74×10^{1}

43 = 0.106
= 1.06×10^{-1}

44 = -6.85
= -6.85×10^{0}

45 = 0.583
= 5.83×10^{-1}

46 = 0.193
= 1.93×10^{-1}

47 = 322 INT.

48 = 1.20
= 1.20×10^{0}

49 = 0.636
= 6.36×10^{-1}

50 = 503
= 5.03×10^{2}

2017-2018 TMSCA Middle School Calculator Test 3 Answer Key

Page 5

51 = 4.83×10^{9}

52 = 3.44×10^{15}

53 = 423
= 4.23×10^{2}

54 = 0.516
= 5.16×10^{-1}

55 = -0.133
= -1.33×10^{-1}

56 = 0.216
= 2.16×10^{-1}

57 = 7.00
= 7.00×10^{0}

58 = -49.3
= -4.93×10^{1}

59 = 21700
= 2.17×10^{4}

60 = 0.111
= 1.11×10^{-1}

Page 6

61 = 61.0
= 6.10×10^{1}

62 = 6360000
= 6.36×10^{6}

63 = 1.60×10^{7}

64 = 0.00613
= 6.13×10^{-3}

65 = 424
= 4.24×10^{2}

66 = -0.00464
= -4.64×10^{-3}

67 = 1790
= 1.79×10^{3}

68 = -1.07
= -1.07×10^{0}

69 = 63.1
= 6.31×10^{1}

70 = 0.815
= 8.15×10^{-1}

71 = 496 INT.

72 = 0.805
= 8.05×10^{-1}

Page 7

73 = 1260
= 1.26×10^{3}

74 = 136000
= 1.36×10^{5}

75 = -0.00146
= -1.46×10^{-3}

76 = 0.0536
= 5.36×10^{-2}

77 = 2.04×10^{7}

78 = 4.15
= 4.15×10^{0}

79 = 238000
= 2.38×10^{5}

80 = -0.107
= -1.07×10^{-1}

TMSCA 2017-2018 MS CA Test 3 Solutions to Word and Geometry Problems

11. $3.3 \times 10^3 - 2.23 \times 10^2$

12. Range = 467- 411

13.

$$\frac{x}{100} = \frac{10}{1{,}000{,}000}$$

24.

$$\frac{\$47.36}{21.672}$$

25.

$$\frac{180 - 105.21}{2}$$

26. Smaller angle = x

Larger angle = 6x

x + 6x = 180; x = 180/7

35.

$$\frac{1}{\sqrt[3]{10^{50}}}$$

36. On HP RPN calculator:

100,000 [ENTER] 850; % chg key

Without the RPN calculator

$$\left(\frac{850 - 100{,}000}{100{,}000}\right)100$$

Don't include the negative on this answer since the word "decrease" implies the negative.

37. $Side = \frac{8223}{4}$

Diagonal = side times $\sqrt{2}$

$= \frac{8223}{4}(\sqrt{2})$

38. Diagonal to opposite vertices on a hexagon = 2 sides or 1/3 of Perimeter.

$$\frac{500100}{3}$$

47. x = larger #; y = smaller #

$$\left\{\begin{matrix} x + y = 729 \\ x - y = 85 \end{matrix}\right\} \text{ OR } \left\{\begin{matrix} x + y = 729 \\ -x + y = -85 \end{matrix}\right\}$$

Add these two equations to get $2y = 644;\ y = 322\ INT$

48. Slope of ax + by = c is $\frac{-a}{b} = \frac{-6}{-5}$

49.

$$\sqrt{.855^2 - .571^2} = x$$

50.

$$\frac{sin\ 65}{1} = \frac{x}{555}$$

$$x = 555\ [\sin(65)]$$

59. $SA = 4\pi r^2 = 4\pi\left(\frac{83.2}{2}\right)^2$

60. There are 4 ways to roll a 5 on two dice: (1,4),(4,1),(2,3),(3,2). There are 36 possible rolls.

$$\frac{4}{36}$$

61. Divide the figure into a long rectangle on the right that is 2 x 13; a shorter rectangle at the top that is 3 x 5; and one at the bottom that is 4 x 5.

Area = 2 (13) + 3(5) + 4(5)

62. The white area = the shaded area = 2521^2

71.

$$\frac{n(n+1)}{2} = \frac{31(32)}{2}$$

72. b = bike & w = wind rate

	R	T	D
against	b-w	4	27
with	b+w	3.23	27

Equations:

$$\left\{\begin{matrix} 4(b-w) = 27 \\ 3.23(b+w) = 27 \end{matrix}\right\}$$

$$= \left\{\begin{matrix} b - w = \frac{27}{4} \\ b + w = \frac{27}{3.23} \end{matrix}\right\}$$

$$= \left\{\begin{matrix} -b + w = -\frac{27}{4} \\ b + w = \frac{27}{3.23} \end{matrix}\right\}$$

Adding these

$$2w = -\frac{27}{4} + \frac{27}{3.23}$$

$$w = \frac{-\frac{27}{4} + \frac{27}{3.23}}{2}$$

73. Tetrahedron = 4 equilateral triangles

$$4\left(\frac{side^2\sqrt{3}}{4}\right) = 27^2\sqrt{3}$$

74. Shaded area = ½ of square =

$$\frac{521^2}{2}$$