8

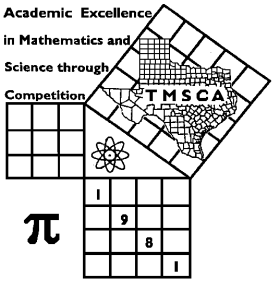
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #13 ©

FEBRUARY 23, 2019

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.

2018-2019 TMSCA Middle School Calculator Test 13

1. 509 – 2350 ---------- 1=_____

2. 23 – 36 + 25 ---------- 2=_____

3. 4690 + 4030 – 5630 ---------- 3=_____

4. π – 6 + 12 – 8 ---------- 4=_____

5. 54 + 15 – 88 – 123 ---------- 5=_____

6. 186 – 185 – 223 – 155 + 76.5 ---------- 6=_____

7. 4.42 + 4.67 + 3.98 + 3.84 + 3.54 ---------- 7=_____

8. –5.21 + 2.11 – π + 3.12 + 4.7 ---------- 8=_____

9. 494 x 340 x 69 ---------- 9=_____

10. 108 x 942 x 316 x 132 ----------10=_____

11. Calculate the median of the first eight terms of the Fibonacci sequence starting with 1,1,2,3 .... ----------11=_____INT.

12. Calculate the diagonal of a square with a perimeter of 712 inches. -12=_____in.

13. The average of five numbers is 390.2. If the first four numbers are 321.8, 562.5, 479.3, and 201.9, calculate the sum of the five numbers. ----------13=_____

14. $(65)[299 \times 113 \times 270]$ ----------14=_____

15. $-199/[133 \times 111 \times 125]$ ----------15=_____

16. $(208 + 154)[289 - 167 - 74]$ ----------16=_____

17. $\{276/133\}\left[\frac{48}{173 + 51}\right]$ ----------17=_____

18. $\frac{[0.0305/(0.163)]/0.0454}{(15.6 \times 18.8)(25)}$ ----------18=_____

19. $\left[\frac{170/157}{203/193}\right]\{11 + 7.69 - 11.1\}$ ----------19=_____

20. $(0.0279)[126/346 \times 245/339] - 0.00543$ ----------20=_____

21. $\frac{43}{(80 - 105)} - \frac{(32 - 88)}{38}$ ----------21=_____

22. $\frac{(592 \times 252)/1310}{(1510 \times 0.0153) + \pi}$ ----------22=_____

23. $\frac{(\pi)(390/334)(63/446)}{(71/221)}$ ----------23=_____

24. The distance from the earth to the moon varies. The distance when the moon is the farthest is called the Apogee. The Apogee in 2018 came on January 14 at a distance of 406,464 km. Convert this distance to miles. ----------24=_____mi.

25. Barbara was not satisfied with the pay of her job. It paid $36,280 per year. This was only eight-thirteenths of what she expected. Calculate how much she expected. ----------25=$_____

26. If the sum of -4 and the opposite of a number is multiplied by -3, the result is 6 less than the product of the number and 2. Calculate the value of the number. ----------26=_____INT

27. $\dfrac{(9.56\text{x}10^{12}) + (3.71\text{x}10^{12})}{(-33.5)(58.7) - 1770}$ ----------27=_____

28. $\dfrac{(4.88 - 1.32)(0.35 + 0.337)}{(1.28\text{x}10^{11})}$ ----------28=_____

29. $\dfrac{(44.9 + 137)(0.626 + 0.865)}{(1.56\text{x}10^{12})}$ ----------29=_____

30. $(7.45)\left[(1.27\text{x}10^{-13}) - (2.51\text{x}10^{-13})\right]$ ----------30=_____

31. $(0.0244)\left[\dfrac{0.0103}{(2.17\text{x}10^{8})}\right]$ ----------31=_____

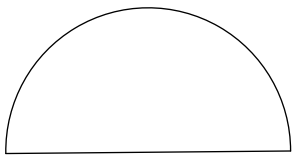
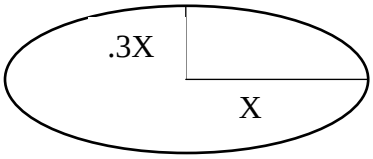
32. $\dfrac{1}{1100} + \dfrac{1}{(2940 - 2260)}$ ----------32=_____

33. $1/(0.316 - 0.238) - 1/(0.0314)$ ----------33=_____

34. $\dfrac{1}{110} - \dfrac{1}{101} + \dfrac{1}{55.3}$ ----------34=_____

35. Calculate the value of 2134 Base 5 in Base 10. ----------35=_____INT.

36. The price of Platinum in July of 1986 was $602.81 per Troy ounce. In July of 2006, the price was $1285.21 per Troy ounce. Calculate the percent change in price from 1986 to 2006. ----------36=_____%

SEMICIRCLE	ELIPSE
 Perimeter = 231.5 Radius = ?	 Area = 512.8 X = ?
37=_____	38=_____

39. $(0.0919 + 0.0356 + 0.092)^2(2990 + 3400)^2$ ----------39=_____

40. $\dfrac{(2430 + 12700)^3}{(0.0216 - 0.0583)^2}$ ----------40=_____

41. $\sqrt[3]{\dfrac{8.33 + 13.1}{0.166 - 0.0546}}$ ----------41=_____

42. $(1/\pi)\sqrt[3]{\dfrac{1.5 + 2.09}{1.58 - 0.652}}$ ----------42=_____

43. $\sqrt{(37.3/88.2) + 0.415 - 0.327}$ ----------43=_____

44. $\sqrt{273 - 143 + 210} - \sqrt{94.9}$ ----------44=_____

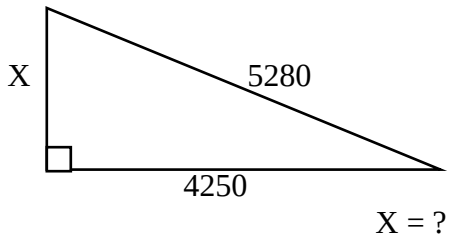
45. $\dfrac{(414 + 353)^{1/2}}{(33.9 - 8.36)^{1/2}}$ ----------45=_____

46. $\sqrt[3]{0.65 - 70.7/241} + 1/\sqrt{21.3 + 4.81}$ ----------46=_____

47. The original price of an item was $1252.87. The store owner discounted the price 25%. After the customer purchased over $5000 in merchandise, the store owner decided to mark down the item another 15%. Calculate the final price of that one item not including tax. ----------47=$_____

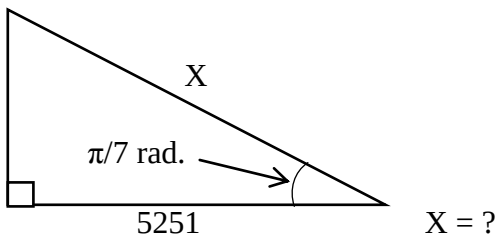
48. If a roof rises 4 inches for every 12 inches of length, calculate the percent slope of the roof. ----------48=_____%

RIGHT TRIANGLE



49=_____

RIGHT TRIANGLE



50=_____

51. $\sqrt{\frac{3.31\text{x}10^{6}}{(1.98\text{x}10^{5})(2.55)}} + \frac{(48.6 - 82.5)}{(4.89 + 8.21)}$ ----------51=_____

52. $\frac{(0.113 + 0.048 - 0.0432)^{2}}{\sqrt{5180 + 35600 + 20800}}$ ----------52=_____

53. $\frac{\sqrt{2.43 + \pi + 5.78}}{(10.9 - 13.4 + 6.75)^{2}}$ ----------53=_____

54. $(786)(2.11\text{x}10^{9})^{1/2} - [(2.85\text{x}10^{14})(2.27\text{x}10^{15})]^{1/4}$ ------54=_____

55. $(3.59)^{2}\sqrt{(307)/(6.5)} - (54.7 + 42.2)$ ----------55=_____

56. $841 + \sqrt{(3560)(3640)} - (4500 + 602)$ ----------56=_____

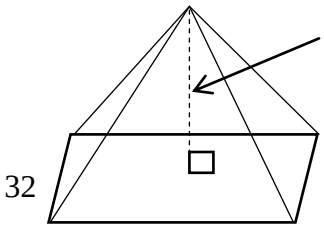
57. $\sqrt{\frac{(19.8)(53.8)}{(112) + (240)}} + 1/(0.574)^{1}$ ----------57=_____

58. $\sqrt{\frac{1/(3210 - 2480)}{(344)(1650 + 1990)^{-2}}}$ ----------58=_____

59. Calculate the number of outfits that can be made, matching or not, from 7 pairs of pants, 10 shirts, and 5 pairs of shoes. ----------59=_____INT.

60. Suppose y varies directly as the square root of x. If y = 72 when when x = 13, calculate y when x = 52. ----------60=_____

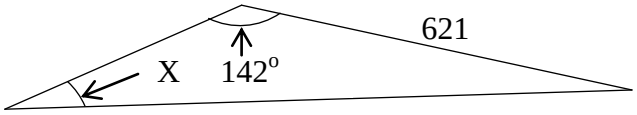
RECTANGULAR BASED PYRAMID



157 Surface Area = ?

61=_____

SCALENE TRIANGLE



789

X^O = ?

62=_____

63. $\frac{9!/8!}{10! + 12!}$ ----------63=_____

64. (deg) (200 – 212)sin(390°) ----------64=_____

65. (deg) (3200 + 4500)tan(15.2°) ----------65=_____

66. (rad) $\frac{\tan(578)}{24.9/132}$ ----------66=_____

67. (rad) $\tan\left[\frac{(130)(\pi)}{(6.18)(55)}\right]$ ----------67=_____

68. (rad) tan[(0.226 – 0.359)(2.47)] ----------68=_____

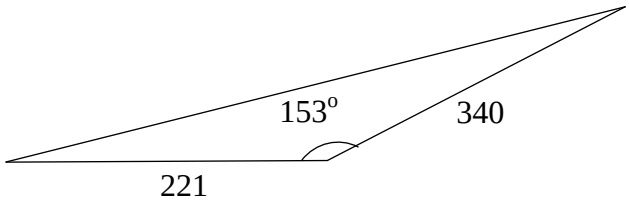
69. (deg) $\frac{\cos(115°)}{6.98 + 16}$ ----------69=_____

70. $(13.3 - 1.67 + 7.8)^{1/3}$ ----------70=_____

71. Calculate the probability of rolling a sum greater than 10 on a standard pair of dice. ----------71=_____

72. A regular octagon has a side length of 52.1 inches. Calculate the length of the apothem in inches. ----------72=_____in.

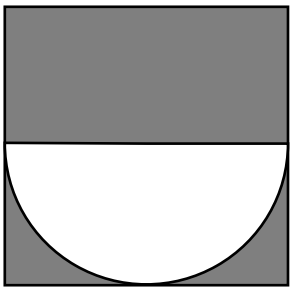
SCALENE TRIANGLE



Area = ?

73=_____

SQUARE AND SEMICIRCLE



Radius of Circle = 729

Shaded Area = ?

74=_____

75. $\frac{\text{Log}(10100 + 8990)}{98.6 - 28.5}$ ----------75=_____

76. $\frac{\text{Log}(8.12\text{x}10^{6} + 7.64\text{x}10^{6})}{28.2}$ ----------76=_____

77. $\text{Log}(3.15 + 6.79 + \pi)$ ----------77=_____

78. $\text{Ln}\left[\frac{15.6 + 29 + 22.7}{694 - 179 - 121}\right]$ ----------78=_____

79. $4 + 6 + 8 + \ldots + 430$ ----------79=_____

80. $1 + (0.66) + \frac{(0.66)^2}{2} + \frac{(0.66)^3}{6} + \frac{(0.66)^4}{24}$ ----------80=_____

2018-2019 TMSCA Middle School Calculator Test 13 Answer Key

Page 1

1 = -1840
= -1.84×10^{3}

2 = 12.0
= 1.20×10^{1}

3 = 3090
= 3.09×10^{3}

4 = 1.14
= 1.14×10^{0}

5 = -142
= -1.42×10^{2}

6 = -301
= -3.01×10^{2}

7 = 20.5
= 2.05×10^{1}

8 = 1.58
= 1.58×10^{0}

9 = 1.16×10^{7}

10 = 4.24×10^{9}

11 = 4 INT.

12 = 252
= 2.52×10^{2}

13 = 1950
= 1.95×10^{3}

Page 2

14 = 5.93×10^{8}

15 = -0.000108
= -1.08×10^{-4}

16 = 17400
= 1.74×10^{4}

17 = 0.445
= 4.45×10^{-1}

18 = 0.000562
= 5.62×10^{-4}

19 = 7.81
= 7.81×10^{0}

20 = 0.00191
= 1.91×10^{-3}

21 = -0.246
= -2.46×10^{-1}

22 = 4.34
= 4.34×10^{0}

23 = 1.61
= 1.61×10^{0}

24 = 253000
= 2.53×10^{5}

25 = $58,955.00

26 = -18 INT.

Page 3

27 = -3.55×10^{9}

28 = 1.91×10^{-11}

29 = 1.74×10^{-10}

30 = -9.24×10^{-13}

31 = 1.16×10^{-12}

32 = 0.00238
= 2.38×10^{-3}

33 = -19.0
= -1.90×10^{1}

34 = 0.0173
= 1.73×10^{-2}

35 = 294 INT.

36 = 113
= 1.13×10^{2}

37 = 45.0
= 4.50×10^{1}

38 = 23.3
= 2.33×10^{1}

Page 4

39 = 1.97×10^{6}

40 = 2.57×10^{15}

41 = 5.77
= 5.77×10^{0}

42 = 0.500
= 5.00×10^{-1}

43 = 0.715
= 7.15×10^{-1}

44 = 8.70
= 8.70×10^{0}

45 = 5.48
= 5.48×10^{0}

46 = 0.905
= 9.05×10^{-1}

47 = $798.70

48 = 33.3
= 3.33×10^{1}

49 = 3130
= 3.13×10^{3}

50 = 5830
= 5.83×10^{3}

2018-2019 TMSCA Middle School Calculator Test 13 Answer Key

Page 5

51 = -0.0274
= -2.74×10^{-2}

52 = 5.59×10^{-5}

53 = 0.187
= 1.87×10^{-1}

54 = 7.74×10^{6}

55 = -8.33
= -8.33×10^{0}

56 = -661
= -6.61×10^{2}

57 = 3.48
= 3.48×10^{0}

58 = 7.26
= 7.26×10^{0}

59 = 350 INT.

60 = 144
= 1.44×10^{2}

Page 6

61 = 15900
= 1.59×10^{4}

62 = 29.0
= 2.90×10^{1}

63 = 1.86×10^{-8}

64 = -6.00
= -6.00×10^{0}

65 = 2090
= 2.09×10^{3}

66 = -0.281
= -2.81×10^{-1}

67 = 2.58
= 2.58×10^{0}

68 = -0.341
= -3.41×10^{-1}

69 = -0.0184
= -1.84×10^{-2}

70 = 2.69
= 2.69×10^{0}

71 = 0.0833
= 8.33×10^{-2}

72 = 62.9
= 6.29×10^{1}

Page 7

73 = 17100
= 1.71×10^{4}

74 = 1290000
= 1.29×10^{6}

75 = 0.0611
= 6.11×10^{-2}

76 = 0.255
= 2.55×10^{-1}

77 = 1.12
= 1.12×10^{0}

78 = -1.77
= -1.77×10^{0}

79 = 46400
= 4.64×10^{4}

80 = 1.93
= 1.93×10^{0}

TMSCA 18-19 MS CA Test #13 Solutions to Word and Geometry Problems

11. Average the 4th and 5th number in the sequence:
1 1 2 3 5. Average 3 and 5.

12. $\left(\frac{712}{4}\right)\sqrt{2}$

13. 390.2(5)

24. Some calculators have a km/mile conversion key. Otherwise do this:

$$406464\ km \cdot \frac{.621mi}{1\ km}$$

25. $\frac{8}{13}x = 36280$

$$x = 36280\left(\frac{13}{8}\right)$$

26. $-3(-4 + -x) = 2x - 6$

$$12 + 3x = 2x - 6$$

Solve for x.

35.

$$2(5^3) + 1(5^2) + 3(5) + 4$$

36. Some calculators have a percent change key. Use it. Otherwise:

$$\frac{1285.21 - 602.81}{602.81} = \frac{x}{100}$$

Solve for x.

37. $\pi r + 2r = 231.5$

$$r(\pi + 2) = 231.5$$

$$r = \frac{231.5}{\pi + 2}$$

38. $\pi[x(.3x)] = 512.8$

$$\pi(.3x^2) = 512.8$$

$$x = \sqrt{\frac{512.8}{.3\pi}}$$

47. $.85(.75)(1252.87)$

48. $\frac{x}{100} = \frac{4}{12};\ x = \frac{400}{12}$

49. $\sqrt{5280^2 - 4250^2}$

50. Change your calculator to radians.

$$\frac{\cos\frac{\pi}{7}}{1} = \frac{5251}{x}$$

$$x = \frac{5251}{\cos\frac{\pi}{7}}$$

59. 7(10)(5)

60. $\frac{72}{\sqrt{13}} = \frac{y}{\sqrt{52}};\ y = \frac{72(\sqrt{52})}{\sqrt{13}}$

61.
Surface area = area of base plus area of all 4 triangles. There are two different slant heights. On the long triangle the slant height$_1$ = $\sqrt{16^2 + 48^2}$
On the smaller triangle the slant height$_2$ = $\sqrt{\left(\frac{157}{2}\right)^2 + 48^2}$
bh will be the combined area of two congruent triangles.
SA = base + 2 triangles + 2 triangles.
SA = 157(32) + $32\left(\sqrt{\left(\frac{157}{2}\right)^2 + 48^2}\right) + 157\left(\sqrt{16^2 + 48^2}\right)$

62. $\frac{\sin 142}{789} = \frac{\sin x}{621}$

$$x = asin\left[\frac{621(\sin 142)}{789}\right]$$

71. $\frac{2+1}{36}$

72. An interior angle of an octagon is $\frac{180(8-2)}{8} = 135^o$
Each triangle within the octagon has base angles of $\frac{135}{2}$ degrees. The apothem is the height of each of these triangles. The height divides the side in half.

$$\frac{\tan\left(\frac{135}{2}\right)}{1} = \frac{a}{\left(\frac{52.1}{2}\right)}$$

$$a = \frac{52.1}{2}\left(\tan\frac{135}{2}\right)$$

73.

$$\boldsymbol{A} = \frac{1}{2}(221)(340)(\sin 153)$$

74. Square = $[729(2)]^2$
Semi-circle = $\frac{\pi(729)^2}{2}$

Subtract these two values for the shaded area.