8

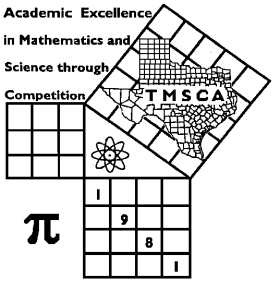
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #10 ©

FEBRUARY 8, 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.

2019-2020 TMSCA Middle School Calculator Test #10

1. 1890 – 5350 ---------- 1=_____

2. 5.5 + 3.59 + 6.9 ---------- 2=_____

3. 40 – 64 – 61 ---------- 3=_____

4. π + 12 + 4 + 7 ---------- 4=_____

5. 624 + 552 + 441 + 1460 ---------- 5=_____

6. –190 + 217 – 90.6 – 126 + 182 ---------- 6=_____

7. (π – 0.478) + (1.34 – 1.87 – 0.862) ---------- 7=_____

8. 2.78 + 1.51 + 2.13 + 1.22 + 0.483 ---------- 8=_____

9. 302 x 176 x 119 ---------- 9=_____

10. 232 x 3300 x 339 x 687 ---------- 10=_____

11. Convert one million centimeters to miles. ---------- 11=_____mi.

12. Calculate the reciprocal of the additive inverse of e^{521}. ---------- 12=_____

13. Jeff and Linda were in a fishing contest. First place last year was ten fish that had an average of 23 pounds. They have caught 9 fish that weighed 21, 33, 15, 17, 22, 25, 10, 32, and 20 pounds. Calculate what the 10^{th} fish would need to weigh to match last years first place average. ---------- 13=_____lbs.

14. $(141)[398 \times 379 \times 508]$ ---------- 14=_____

15. $-69 - [51/154 + 0.832]$ ---------- 15=_____

16. $\{105/41\}\left[\frac{95}{101 + 204}\right]$ ---------- 16=_____

17. $(33 + 71)[65 - 58 - 46]$ ---------- 17=_____

18. $\left[\frac{(0.924 + 0.386)}{498/583}\right]\left[\frac{0.00467}{6.93}\right]$ ---------- 18=_____

19. $\left[\frac{(521/352) - (842/406)}{13.3/(40.6)}\right]$ ---------- 19=_____

20. $\frac{0.00115 + 0.00192 + 0.00108}{(4.88 \times 10^{-4})(187)(1630)}$ ---------- 20=_____

21. $(0.0683)[187/258 \times 133/157] - 0.0312$ ---------- 21=_____

22. $\frac{(1570 \times 1340)/3260}{(2210 \times 0.881) + 590}$ ---------- 22=_____

23. $\frac{(\pi)(89/120)(331/249)}{(520/107)}$ ---------- 23=_____

24. Jenifer purchased a new washer and dryer set for her home. She paid $469.95 for each piece. She gets 0% financing for 24 months. Calculate her monthly payment if she wants to pay the pair off in those 24 months. ---------- 24=$_____

25. It is estimated that the giant pyramid of Cheops in Egypt was built with 2,300,000 blocks of stone. If the builders used 80% of the available blocks, calculate the number of blocks that were available. ---------- 25=_____INT.

26. A 30-60-90 right triangle has a hypotenuse that measures 764.21 feet. Calculate the area of the triangle in square feet. ---------- 26=_____$ft.^2$

27. $\dfrac{(0.00212 - 0.00751)(0.232 + 0.136)}{(3.28\text{x}10^{10})}$ ---------- 27=_____

28. $(523)[(32.8/100)(0.868 + 2.41)]$ ---------- 28=_____

29. $\dfrac{(0.0205 + 0.00314)(0.00887 + 0.00939)}{(9.21\text{x}10^{10})}$ ---------- 29=_____

30. $\dfrac{1}{-1.34} + \dfrac{1}{(\pi)(1.2 - 1.98)}$ ---------- 30=_____

31. $(28.1)\left[(1.05\text{x}10^{6}) - (2.51\text{x}10^{6})\right]$ ---------- 31=_____

32. $(18.1)\left[\dfrac{8.10\text{x}10^{-4}}{(1.33\text{x}10^{12})}\right]$ ---------- 32=_____

33. $\dfrac{1}{30.3} - \dfrac{1}{(64.7 + 68.5)}$ ---------- 33=_____

34. $\left[\dfrac{1/1050}{1/3350}\right][2.28\text{x}10^{6}]$ ---------- 34=_____

35. Three feet are cut off a 12-foot board. Calculate the percent change in the original 12-foot board. ---------- 35=_____%

36. A square and a circle have the same area. If the diagonal of the square is 13.33 inches, calculate the radius of the circle. --------- 36=_____in.

RECTANGLE

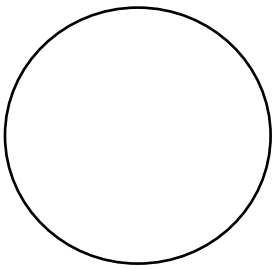
$5.28\text{x}10^{5}$

Perimeter = $1.52\text{x}10^{6}$

Width = ?

37=_____

CIRCLE



Circumference = 0.520

Area = ?

38=_____

39. $(78.2 + 276)^2(0.0719 + 0.042)^2$ ---------- 39=_____

40. $(90.1 + 127 + 158)^2(3.78 + 11.6)^2$ ---------- 40=_____

41. $\dfrac{(54200 + 39000)^2}{(0.0221 - 0.0101)^3}$ ---------- 41=_____

42. $(1/(0.0146))(365 - 198)^2$ ---------- 42=_____

43. $\sqrt{54.7} + \sqrt{110 + 157} - (\pi)\sqrt{117}$ ---------- 43=_____

44. $\sqrt{1510 - 362 + 742} - \sqrt{742}$ ---------- 44=_____

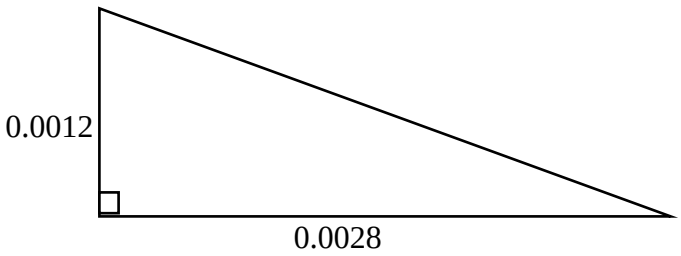
45. $\sqrt[3]{0.96 - 1960/2230} + 1/\sqrt{183 + 1640}$ ---------- 45=_____

46. $\dfrac{(98.2 + 18.2)^{1/3}}{(8650 - 3680)^{1/4}}$ ---------- 46=_____

47. The number 7777 Base 8 is equal to what number in Base 10. -- 47=_____INT.

48. Calculate the geometric mean -6^{π} and $-\pi^{6}$. ---------- 48=_____

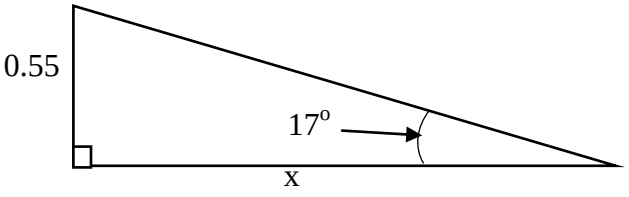
RIGHT TRIANGLE



Hypotenuse = ?

49=_____

RIGHT TRIANGLE



x = ?

50=_____

51. $\left[\frac{\sqrt{\sqrt{34800 - 13300}}}{-(0.0143 - 0.0308)}\right]^3 [57800 + 1.03\text{x}10^5]$ ---------- 51=_____

52. $\left[\frac{845 - 740 + \sqrt{89700/37.3}}{-181 + 281}\right]^4$ ---------- 52=_____

53. $\frac{\sqrt{0.178 + \pi + 1.19}}{(7.28 - 8.83 + 7.57)^4}$ ---------- 53=_____

54. $\sqrt{\frac{(10000)(4900)}{(28000)(1990)}} - 0.132 + 0.468$ ---------- 54=_____

55. $(247)(1.13\text{x}10^8)^{1/4} - [(4.06\text{x}10^8)(1.11\text{x}10^9)]^{1/4}$ ------- 55=_____

56. $0.12 + \sqrt{(18.6)/(665)} - (0.145 + 0.305)^2$ ---------- 56=_____

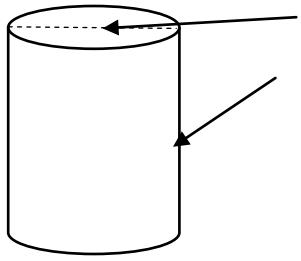
57. $\sqrt{\frac{(369)(92.7)}{(2230) + (1870)}} + 1/(1.3)^{-4}$ ---------- 57=_____

58. $\sqrt{\frac{1/(4360 - 3750)}{(235)(62.4 + 30.5)^4}}$ ---------- 58=_____

59. A team has a 70% chance of winning the game.
Calculate the odds the team has of winning the game. ---------- 59=_____

60. Jillian and Rhonda are canoeing a section of the river that is 25 miles long. It takes them three and a half hours to make the trip going down stream. The return trip takes them four hours fifteen minutes. Calculate the speed of the river current in this 25 mile stretch. ---------- 60=_____mph

RIGHT CIRCULAR CYLINDER



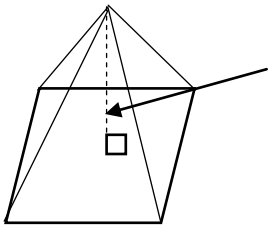
Diameter = 12.87

Height = 16.00

Volume = ?

61=_____

SQUARE BASED PYRAMID



Height = 17.4

18.6

Surface Area = ?

62=_____

63. $\frac{11!}{24!}$ ---------- 63=_____

64. (deg) $\frac{\sin(17.7°)}{261}$ ---------- 64=_____

65. (deg) $(43.5 - 85.3)\cos(70.3°)$ ---------- 65=_____

66. (rad) $\tan\left[\frac{(61.2)(\pi)}{(683)(10.9)}\right]$ ---------- 66=_____

67. (deg) $\tan(328° - 288°) + 0.321$ ---------- 67=_____

68. (deg) $\frac{\sin(4.78°) - \tan(4.78°)}{\sin(4.78°)}$ ---------- 68=_____

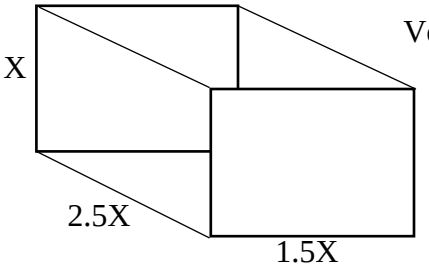
69. (rad) $(26.7)\cos(29.8)$ ---------- 69=_____

70. $(7.66 + 8.13 + 5.59)^{4/5}$ ---------- 70=_____

71. Calculate the number of liters of water that must be added to 30 liters of a 45% acid solution in order to produce a 25% solution. ---------- 71=_____l

72. Calculate how many ways the single digit prime numbers can be arranged into a three-digit number if repetition is not allowed. -- 72=_____INT.

RECTANGULAR PRISM

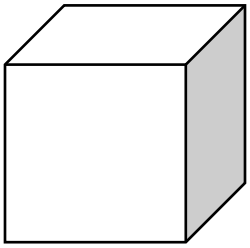


Volume = 26459

X = ?

73=_____

CUBE



Inner Diagonal = 1229

Edge = ?

74=_____

75. $\dfrac{0.00865 + \sqrt{(0.00385)(0.0111) + (0.0264)(0.122)}}{\sqrt{\sqrt{0.00709 + 0.00938}}}$ ------- 75=_____

76. $\dfrac{\text{Log}(2.68\text{x}10^{8} + 2.01\text{x}10^{8})}{25.9}$ ---------- 76=_____

77. $\dfrac{62200 - 65500}{\text{Log}(254 + 263)}$ ---------- 77=_____

78. $\text{Ln}\left[\dfrac{472 + 591 + 519}{125 - 7.42 - 40.4}\right]$ ---------- 78=_____

79. $1 + 3 + 5 + \ldots + 791$ ---------- 79=_____

80. $(0.21) - \dfrac{(0.21)^2}{2} + \dfrac{(0.21)^3}{3} - \dfrac{(0.21)^4}{4}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #10 Answer Key

Page 1

1 = -3460
= -3.46×10^{3}

2 = 16.0
= 1.60×10^{1}

3 = -85.0
= -8.50×10^{1}

4 = 26.1
= 2.61×10^{1}

5 = 3080
= 3.08×10^{3}

6 = -7.60
= -7.60×10^{0}

7 = 1.27
= 1.27×10^{0}

8 = 8.12
= 8.12×10^{0}

9 = 6.33×10^{6}

10 = 1.78×10^{11}

11 = 6.21
= 6.21×10^{0}

12 = -5.40×10^{-227}

13 = 35.0
= 3.50×10^{1}

Page 2

14 = 1.08×10^{10}

15 = -70.2
= -7.02×10^{1}

16 = 0.798
= 7.98×10^{-1}

17 = -4060
= -4.06×10^{3}

18 = 0.00103
= 1.03×10^{-3}

19 = -1.81
= -1.81×10^{0}

20 = 2.79×10^{-5}

21 = 0.0107
= 1.07×10^{-2}

22 = 0.254
= 2.54×10^{-1}

23 = 0.637
= 6.37×10^{-1}

24 = $39.17

25 = 2,875,000 INT.

26 = 126000
= 1.26×10^{5}

Page 3

27 = -6.05×10^{-14}

28 = 562
= 5.62×10^{2}

29 = 4.69×10^{-15}

30 = -1.15
= -1.15×10^{0}

31 = -4.10×10^{7}

32 = 1.10×10^{-14}

33 = 0.0255
= 2.55×10^{-2}

34 = 7.27×10^{6}

35 = -25.0
= -2.50×10^{1}

36 = 5.32
= 5.32×10^{0}

37 = 232000
= 2.32×10^{5}

38 = 0.0215
= 2.15×10^{-2}

Page 4

39 = 1630
= 1.63×10^{3}

40 = 3.33×10^{7}

41 = 5.03×10^{15}

42 = 1.91×10^{6}

43 = -10.2
= -1.02×10^{1}

44 = 16.2
= 1.62×10^{1}

45 = 0.456
= 4.56×10^{-1}

46 = 0.582
= 5.82×10^{-1}

47 = 4095 INT.

48 = 517
= 5.17×10^{2}

49 = 0.00305
= 3.05×10^{-3}

50 = 1.80
= 1.80×10^{0}

2019-2020 TMSCA Middle School Calculator Test #10 Answer Key

Page 5

51 = 6.36×10^{13}

52 = 5.63
= 5.63×10^{0}

53 = 0.00162
= 1.62×10^{-3}

54 = 1.27
= 1.27×10^{0}

55 = -443
= -4.43×10^{2}

56 = 0.0847
= 8.47×10^{-2}

57 = 5.74
= 5.74×10^{0}

58 = 3.06×10^{-7}

59 = 2.33
= 2.33×10^{0}

60 = 0.630
= 6.30×10^{-1}

Page 6

61 = 2080
= 2.08×10^{3}

62 = 1080
= 1.08×10^{3}

63 = 6.43×10^{-17}

64 = 0.00116
= 1.16×10^{-3}

65 = -14.1
= -1.41×10^{1}

66 = 0.0258
= 2.58×10^{-2}

67 = 1.16
= 1.16×10^{0}

68 = -0.00349
= -3.49×10^{-3}

69 = -1.20
= -1.20×10^{0}

70 = 11.6
= 1.16×10^{1}

71 = 24.0
= 2.40×10^{1}

72 = 24 INT.

Page 7

73 = 19.2
= 1.92×10^{0}

74 = 710
= 7.10×10^{2}

75 = 0.0514
= 5.14×10^{-2}

76 = 0.335
= 3.35×10^{-1}

77 = -1220
= -1.22×10^{3}

78 = 3.02
= 3.02×10^{0}

79 = 157000
= 1.57×10^{5}

80 = 0.191
= 1.91×10^{-1}

TMSCA 19-20 MS CA Test #10 Solutions to Word and Geometry Problems

11. Multiply the following:
$(1{,}000{,}000\ cm)\left(\frac{1\ km}{100000\ cm}\right)\left(\frac{1\ mile}{1.61\ km}\right)$ or some calculators have a conversion key.

12. $\frac{1}{-(e^{521})}$

13. $23(10)$ minus the sum of the other 9 fish.

24. $\frac{2(469.95)}{24}$

25. $.8x = 2{,}300{,}000$
$x = \frac{2{,}300{,}000}{.8}$

26. short leg = $\frac{764.21}{2}$
Long leg = $\left(\frac{764.21}{2}\right)\sqrt{3}$
Area = ½ (product of two legs)

35. $\frac{9-12}{12}(100)$ or some calculators have a % change key.

36. Square A = $\frac{(13.33)^2}{2} = \pi r^2$
$r = \sqrt{\frac{(13.33)^2}{2\pi}}$

37. $\frac{1.52\ x\ 10^6 - 2(5.28\ x\ 10^5)}{2}$

38. C = $2\pi r = .52$
$r = \frac{.52}{2\pi}$
Area = $\pi r^2 = \pi\left(\frac{.52}{2\pi}\right)^2$

47. $7(8^3) + 7(8^2) + 7(8) + 7(1)$

48. $\sqrt{(-6^{\pi})(-\pi^6)}$

49. $\sqrt{(.0012)^2 + (.0028)^2}$

50. $\frac{\tan 17}{1} = \frac{.55}{x}$ $x = \frac{.55}{tan\ 17}$

59. $\frac{70}{30}$

60. c = rate of canoe in still water
r = rate of river
c+r is the rate going downstream
c-r is the rate going upstream

	rate	x time	= distance
down	c+r	3.5	3.5(c+r)
up	c-r	4.25	4.25(c-r)

$\begin{Bmatrix} 3.5(c+r) = 25 \\ 4.25(c-r) = 25 \end{Bmatrix}$

Divide first equation by 3.5 and 2nd equation by - 4.25

$\begin{Bmatrix} c + r = \frac{25}{3.5} \\ -c + r = -\frac{25}{4.25} \end{Bmatrix}$

$2r = \frac{25}{3.5} - \frac{25}{4.25}$

$r = \left(\frac{25}{3.5} - \frac{25}{4.25}\right) \div 2$

61. $V = \pi r^2 h =$

$\pi\left(\frac{12.87}{2}\right)^2(16)$

62. slant height =
$\sqrt{(17.4)^2 + \left(\frac{18.6}{2}\right)^2}$
SA = $(18.6)^2 + \frac{4(18.6)(slant\ ht)}{2}$

71. Liters of solution times % acid = liters of pure acid

	Sol lit	%-dec	Acid
Sol 1	30	.45	13.5
water	x	0	0
mixture	30+x	.25	.25(30+x)

$13.5 = .25(30 + x)$
Solve for x.

72.
Single digit primes: 2,3,5,7
4 x 3 x 2 x 1 = 24

73.
$(2.5x)(1.5x)(x) = 26459$
$3.75x^3 = 26459$
$x = \sqrt[3]{\frac{26459}{3.75}}$

74. $\frac{1229}{\sqrt{3}}$