8

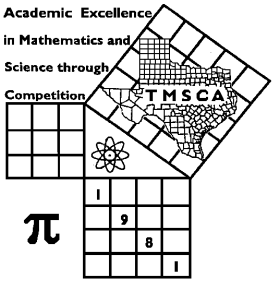
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 6, 2021

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.

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1. $-3390 - 4600$ ---------- 1=_____

2. $1.29 + 2.4 + 3.5$ ---------- 2=_____

3. $726 - 495 + 108$ ---------- 3=_____

4. $\pi + 12 - 13 - 3$ ---------- 4=_____

5. $39 + 197 + 104 + 50$ ---------- 5=_____

6. $226 + 194 - 216 - 76.4 + 39.9$ ---------- 6=_____

7. $0.251 + 1.73 + 0.92 + 0.207 + 1.68$ ---------- 7=_____

8. $(3.18 - \pi) + (2.38 - 3.64 - 4.98)$ ---------- 8=_____

9. $142 \times 427 \times 77$ ---------- 9=_____

10. $727 \times 442 \times 140 \times 645$ ---------- 10=_____

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

12. Calculate the additive inverse of the reciprocal of the log of one million. ---------- 12=_____

13. John had an average of 93 in her math class. He wants to get that average up to a 95 by the end of the semester. 70% of the grades have been taken. Calculate his average needed on the last 30% of grades to achieve a 95 average. ---------- 13=_____

14. $(116)[159 \times 43 \times 143]$ ---------- 14=_____

15. $(365)[286 \times 133/126]$ ---------- 15=_____

16. $\{(95)(24 - 55)(19)\} - 24100$ ---------- 16=_____

17. $\left[\frac{191}{81}\right][(80/23) + \pi]$ ---------- 17=_____

18. $\frac{(105/243) + (226/194)}{(0.0201 - 0.00712)}$ ---------- 18=_____

19. $\left[\frac{(929/209) - (1700/657)}{0.455/(0.403)}\right]$ ---------- 19=_____

20. $\frac{(0.00133)(24.9)}{2.76 \times 10^{-4}}(27 - 24.9)$ ---------- 20=_____

21. $\frac{(\pi)(6/12)(15/14)}{179}$ ---------- 21=_____

22. $\left[\frac{1150 + 1440}{719 - 239}\right]\left[\frac{590}{1130}\right]$ ---------- 22=_____

23. $\frac{(\pi)(18/42)(92/88)}{(91/53)}$ ---------- 23=_____

24. Kristen purchased new appliances for her kitchen. The oven cost $549.99, the refrigerator cost $1268.99 and the dishwasher cost $359.95. She has applied for credit terms of 0% for 36 months and gets it. Calculate her monthly payment if she wants to pay off the appliances in those 36 months. ---------- 24=$_____

25. A pro golfer hits his 4-iron 235 yards. This is only 85% of the distance he usually hits it. Calculate the distance in yards he usually hits it. ---------- 25=_____yds.

26. A 30-60-90 right triangle has a hypotenuse that measures 529.06 inches. Calculate the area of the triangle in square inches. ------ 26=_____$in.^2$

27. $\dfrac{(1.1 + \pi)(0.0372 + 0.0607)}{(1.40\text{x}10^{12})}$ ---------- 27=_____

28. $\dfrac{(3.08\text{x}10^{9}) + (3.41\text{x}10^{9})}{(-37.3)(28.9) - 983}$ ---------- 28=_____

29. $[484 - (1040 + 409)] + [(2.2)(460 - 638)]$ ---------- 29=_____

30. $(37.4)\left[(4.44\text{x}10^{7}) - (4.82\text{x}10^{7})\right]$ ---------- 30=_____

31. $(2.64)\left[\dfrac{\pi}{(9.94\text{x}10^{7})}\right]$ ---------- 31=_____

32. $\dfrac{1}{15} + \dfrac{1}{(116 - 109)}$ ---------- 32=_____

33. $\dfrac{1}{164} - \dfrac{1}{(213 + 191)}$ ---------- 33=_____

34. $\dfrac{1}{110} - \dfrac{1}{159} + \dfrac{1}{37}$ ---------- 34=_____

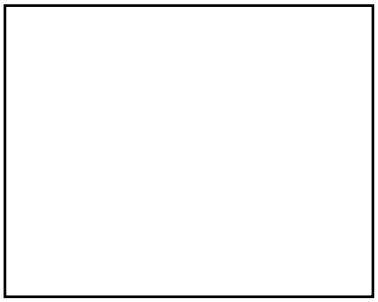
35. Kyle Stadium only allowed 38,545 fans in for the game. The capacity of the stadium is 102,733. Calculate the percent decrease in attendees. ---------- 35=_____%

36. A circle and an equilateral triangle have the same area. If a side of the triangle measures 37.8 inches, calculate the radius of the circle in inches. ---------- 36=_____in.

37.

RECTANGLE

$6.4\text{X}10^{9}$



X

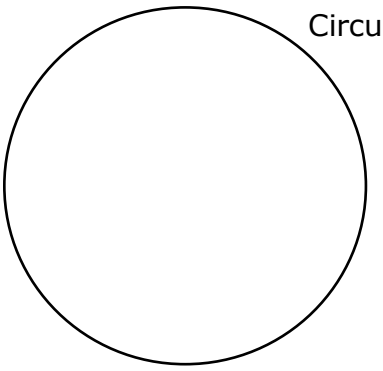
Perimeter = $2.38\text{x}10^{10}$ X = ?

37=_____

38.

CIRCLE

Circumference = 0.0351



Area = ?

38=_____

39. $\dfrac{(35700 + 65600)^2}{(0.0499 - 0.0813)^3}$ ---------- 39=_____

40. $\left[\dfrac{3060}{35.5}\right](55.7 + 51.5)^4$ ---------- 40=_____

41. $\left[\dfrac{501 + (1/(9.24\text{x}10^{-4}))}{(423/597) - 0.228}\right]^2$ ---------- 41=_____

42. $(1/(0.0112))(4830 - 4690)^3$ ---------- 42=_____

43. $\sqrt{(8.55/68.9) + 0.121 - 0.0784}$ ---------- 43=_____

44. $\sqrt{897 - 745 + 696} - \sqrt{627}$ ---------- 44=_____

45. $\dfrac{(21000 + 18800)^{1/2}}{(24.6 - 19.4)^{1/4}}$ ---------- 45=_____

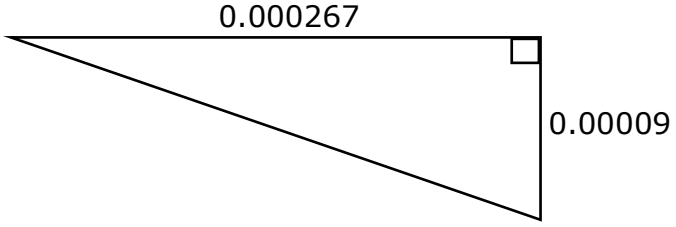
46. $\sqrt{1.05 - 1860/3730} + 1/\sqrt{2.61 + 3.08}$ ---------- 46=_____

47. Calculate the value of 3532 Base 6 in Base 10. ---------- 47=_____INT.

48. Calculate the geometric mean of ln25, log5, and the 5^5. --------- 48=_____

49.

RIGHT TRIANGLE

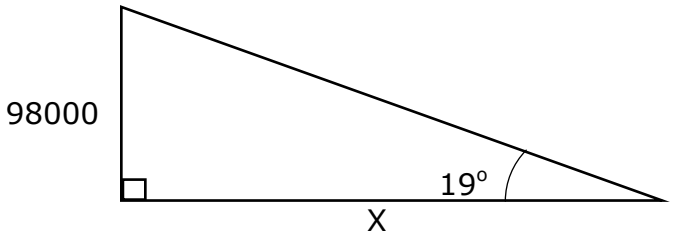


Hypotenuse = ?

49=_____

50.

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{55.6 + 44.2 + \sqrt{7060 + 9310}}{899/4620}\right]^3$ ---------- 51=_____

52. $\sqrt{\frac{1.01\text{x}10^{12}}{(81900)(1.23)}} + \frac{(2.19\text{x}10^5 - 60900)}{(20 + 18.7)}$ ---------- 52=_____

53. $\left[\frac{\sqrt{\sqrt{24100 - 16000}}}{-(2.19 - 4.54)}\right]^2 [1010 + 304]$ ---------- 53=_____

54. $(331)(3.04\text{x}10^8)^{1/4} - [(1.87\text{x}10^6)(4.69\text{x}10^7)]^{1/3}$ ------- 54=_____

55. $(1.33)^2 \sqrt{(646)/(77.3)} - (1.38 + 3.2)$ ---------- 55=_____

56. $\sqrt{\frac{(3.23\text{x}10^5)(94200)}{(29500)(21800)}} - 2.52 + 4.22$ ---------- 56=_____

57. $\sqrt{\frac{(5340)(1570)}{(1390) + (1530)}} + 1/(7.32)^{-2}$ ---------- 57=_____

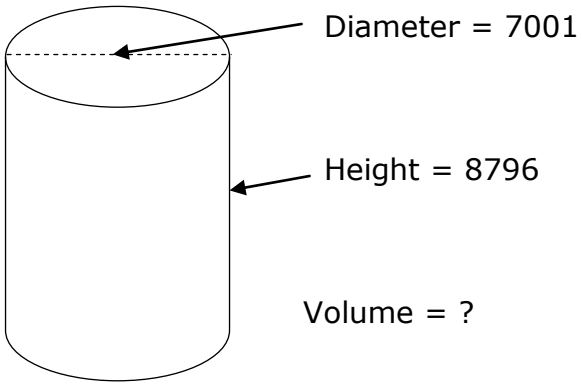
58. $\sqrt{\frac{(16.6)(22.8)}{(407) + (151)}} - 2.11$ ---------- 58=_____

59. The meteorologist says that the probability of rain on Tuesday is 65%. Calculate the odds of it raining on Tuesday according to the meteorologist. ---------- 59=_____

60. A river boat traveling 52 miles against the current in 2 hours makes the return trip with the current in 1 hour, 15 minutes. Calculate the speed of the current in miles per hour. ---------- 60=_____mph

61.

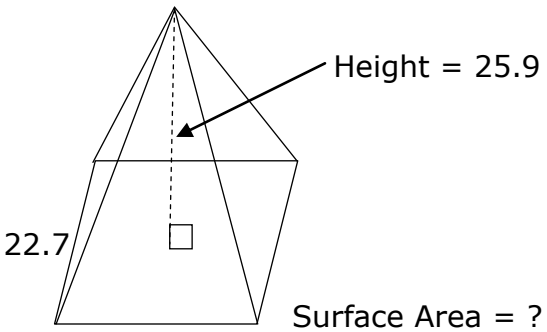
RIGHT CIRCULAR CYLINDER



61=_____

62.

SQUARE BASED PYRAMID



62=_____

63. $\frac{7! - 9!}{8!}$ ---------- 63=_____

64. $(13.7 - \pi)e^{0.545}$ ---------- 64=_____

65. (deg) $(180 - 131)\cos(646°)$ ---------- 65=_____

66. (rad) $\frac{\tan(168)}{184/160}$ ---------- 66=_____

67. (rad) $\sin\left[\frac{(0.713)(\pi)}{(4.47)(125)}\right]$ ---------- 67=_____

68. (rad) $\tan[(0.537 - 1.76)(16.4)]$ ---------- 68=_____

69. (deg) $\frac{\sin(151°) - \tan(151°)}{\sin(151°)}$ ---------- 69=_____

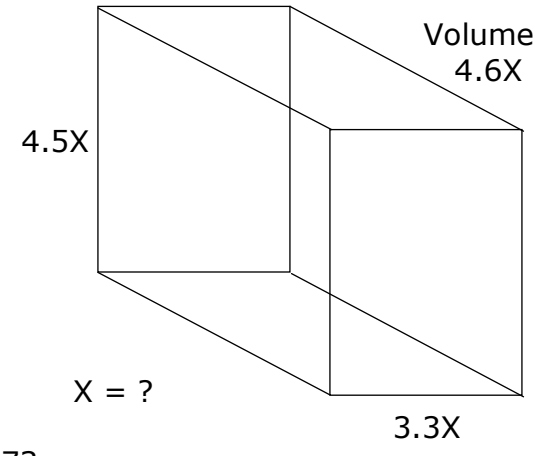
70. $(38.4 - 34.8 + 17.6)^{4/3}$ ---------- 70=_____

71. Calculate the number of liters of water that must be added to 40 liters of a 55% acid solution to produce a 10% solution. --------- 71=_____l

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

73.

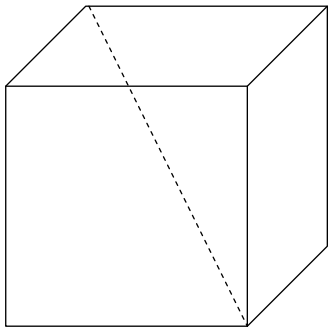
RECTANGULAR PRISM



73=_____

74.

CUBE



74=_____

75. $\frac{\text{Log}(5.07\text{x}10^{9} + 2.22\text{x}10^{10})}{12.9}$ ---------- 75=_____

76. $\frac{\text{Log}(608 + 1890)}{16.7 - 15.8}$ ---------- 76=_____

77. $\text{Log}\sqrt{\frac{126 - 50.9}{(77.6)(2.32)}}$ ---------- 77=_____

78. $\frac{(e^{0.244})(e^{0.422})(e^{0.192})}{\text{Ln}(60.8 + 50.2)}$ ---------- 78=_____

79. $1 + 2 + 3 + \ldots + 207$ ---------- 79=_____

80. $\frac{1}{(0.85)} + \frac{1}{3(0.85)^3} + \frac{1}{5(0.85)^5} + \frac{1}{7(0.85)^7}$ ---------- 80=_____

2020 – 2021 TMSCA Middle School Calculator Test #10 Answer Key

Page 1

1 = -7990
= -7.99×10^{3}

2 = 7.19
= 7.19×10^{0}

3 = 339
= 3.39×10^{2}

4 = -0.858
= -8.58×10^{-1}

5 = 390
= 3.90×10^{2}

6 = 168
= 1.68×10^{2}

7 = 4.79
= 4.79×10^{0}

8 = -6.20
= -6.20×10^{0}

9 = 4.67×10^{6}

10 = 2.90×10^{10}

11 = 1.61×10^{11}

12 = -0.167
= -1.67×10^{-1}

13 = 99.7
= 9.97×10^{1}

Page 2

14 = 1.13×10^{8}

15 = 110000
= 1.10×10^{5}

16 = -80100
= -8.01×10^{4}

17 = 15.6
= 1.56×10^{1}

18 = 123
= 1.23×10^{2}

19 = 1.65
= 1.65×10^{0}

20 = 252
= 2.52×10^{2}

21 = 0.00940
= 9.40×10^{-3}

22 = 2.82
= 2.82×10^{0}

23 = 0.820
= 8.20×10^{-1}

24 = $60.53

25 = 276
= 2.76×10^{2}

26 = 60600
= 6.06×10^{4}

Page 3

27 = 2.97×10^{-13}

28 = -3.15×10^{6}

29 = -1360
= -1.36×10^{3}

30 = -1.42×10^{8}

31 = 8.34×10^{-8}

32 = 0.210
= 2.10×10^{-1}

33 = 0.00362
= 3.62×10^{-3}

34 = 0.0298
= 2.98×10^{-2}

35 = 62.5
= 6.25×10^{1}

36 = 14.0
= 1.40×10^{1}

37 = 5.50×10^{9}

38 = 0.0000980
= 9.80×10^{-5}

Page 4

39 = -3.31×10^{14}

40 = 1.14×10^{10}

41 = 1.09×10^{7}

42 = 2.45×10^{8}

43 = 0.408
= 4.08×10^{-1}

44 = 4.08
= 4.08×10^{0}

45 = 132
= 1.32×10^{2}

46 = 1.16
= 1.16×10^{0}

47 = 848 INT.

48 = 19.2
= 1.92×10^{1}

49 = 0.000282
= 2.82×10^{-4}

50 = 285000
= 2.85×10^{5}

2020 – 2021 TMSCA Middle School Calculator Test #10 Answer Key

Page 5

51 = 1.60×10^{9}

52 = 7250
= 7.25×10^{3}

53 = 21400
= 2.14×10^{4}

54 = -723
= -7.23×10^{2}

55 = 0.534
= 5.34×10^{-1}

56 = 8.58
= 8.58×10^{0}

57 = 107
= 1.07×10^{2}

58 = -1.29
= -1.29×10^{0}

59 = 1.86
= 1.86×10^{0}

60 = 7.80
= 7.80×10^{0}

Page 6

61 = 3.39×10^{11}

62 = 1800
= 1.80×10^{3}

63 = -8.88
= -8.88×10^{0}

64 = 18.2
= 1.82×10^{1}

65 = 13.5
= 1.35×10^{1}

66 = 11.5
= 1.15×10^{1}

67 = 0.00401
= 4.01×10^{-3}

68 = -2.63
= -2.63×10^{0}

69 = 2.14
= 2.14×10^{0}

70 = 58.7
= 5.87×10^{1}

71 = 180
= 1.80×10^{2}

72 = 60 INT.

Page 7

73 = 2.87
= 2.87×10^{0}

74 = 120000
= 1.20×10^{5}

75 = 0.809
= 8.09×10^{-1}

76 = 3.78
= 3.78×10^{0}

77 = -0.190
= -1.90×10^{-1}

78 = 0.501
= 5.01×10^{-1}

79 = 21500
= 2.15×10^{4}

80 = 2.62
= 2.62×10^{0}

TMSCA 2020-2021 MS CA Test 10 Solutions to Word and Geometry Problems

11. 1.61 km $\approx$ 1 $mi.$
1,000,000 mi $\approx 1.61\ x\ 10^6 km$
Multiply by 10^5 to change to cm.

12. $-\left(\frac{1}{Log\ 1{,}000{,}000}\right)$

13. $93(.7) + .3x = 95$
$$x = \frac{95 - 93(.7)}{.3}$$

24. $\frac{549.99+1268.99+359.95}{36}$

25. $\frac{85}{100} = \frac{235}{x}; x = \frac{235(100)}{85}$

26. The short leg is half of the hypotenuse. The long leg is $\sqrt{3}$ times the short leg.
Legs: $x = \frac{529.06}{2}$
$$y = \left(\frac{529.06}{2}\right)\sqrt{3}$$
Area = $\frac{\left(\frac{529.06}{2}\right)\left(\left(\frac{529.06}{2}\right)\sqrt{3}\right)}{2}$

35. Some calculators have a % change key. If not,
$$\frac{38545 - 102733}{102733} \cdot 100$$
Don't include the negative since the problem says % decrease.

36. Area of triangle = $\frac{(37.8)^2\sqrt{3}}{4}$ =
Area of circle = πr^2
$$r = \sqrt{\frac{(37.8)^2\sqrt{3}}{4} \div \pi}$$

37. $\frac{2.38\ x\ 10^{10} - (6.4\ x\ 10^9)(2)}{2}$

38. $2\pi r = .0351; r = \frac{.0351}{2\pi}$
A = $\pi r^2 = \pi\left(\frac{.0351}{2\pi}\right)^2$

47. $3(6^3) + 5(6^2) + 3(6) + 2$

48. $\sqrt[3]{(ln25)(Log5)(5^5)}$

49. $\sqrt{(.000267)^2 + (.00009)^2}$

50. $\frac{tan}{1} = \frac{98000}{x}\ x = \frac{98000}{\tan 19}$

59. $\frac{65}{35}$

60.

	R	T	Dist
down	B+c	1.25	1.25(B+c)
up	B-c	2	2(B-c)

$$\begin{Bmatrix} 1.25(B + c) = 52 \\ 2(B - c = 52) \end{Bmatrix}$$
$$\begin{Bmatrix} B + c = \frac{52}{1.25} \\ B - c = \frac{52}{2} \end{Bmatrix}$$
Change signs in 2nd equation and add them together.
$$2c = \frac{52}{1.25} - 26$$
$$c = \left(\frac{52}{1.25} - 26\right) \div 2$$

61. $V = \pi r^2 h; r = \frac{7001}{2}$
$$V = \pi\left(\frac{7001}{2}\right)^2 (8796)$$

62. slant height = $\sqrt{25.9^2 + \left(\frac{22.7}{2}\right)^2}$
One triangular face = $\frac{slant(22.7)}{2}$
Surface area = 4 triangles plus the square base
$$4\left(\sqrt{25.9^2 + \left(\frac{22.7}{2}\right)^2}\right)\left(\frac{22.7}{2}\right) + 22.7^2$$

71.

L of sol	% acid	Pure acid
40	.55	40(.55)
x	0	0
40+x	.10	.1(40+X)

$$40(.55) = .1(40 + x)$$
22 = 4 + .1x; x = 18 ÷ .1

72. Permutations 5, choose 3.
$\frac{5!}{(5-3)!}$

73.
$$4.6x(4.5x)(3.3x) = 1606.5$$
$$x = \sqrt[3]{\frac{1606.5}{4.6(4.5)(3.3)}}$$

74. Edge = $\frac{207000}{\sqrt{3}}$