8

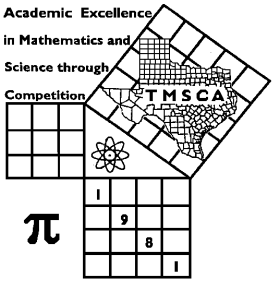
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



T M S C A M I D D L E S C H O O L

C A L C U L A T O R

T E S T # 1 ©

O C T O B E R 1 7 , 2 0 2 0

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 #1

1. 2780 – 4980 ---------- 1=_____

2. 0.899 + 1 + 8.8 ---------- 2=_____

3. 56 – 340 + 247 ---------- 3=_____

4. π – 5 – 15 – 13 ---------- 4=_____

5. 187 + 661 + 215 + 72 ---------- 5=_____

6. 207 + 207 – 149 – 103 + 117 ---------- 6=_____

7. 0.663 + 1.1 – 0.265 + π + 0.4 ---------- 7=_____

8. –3.11 – 2.15 + 4.39 – 4.16 – π ---------- 8=_____

9. 207 x 285 x 96.1 ---------- 9=_____

10. 50.5 x 125 x 5350 x 220 ---------- 10=_____

11. Calculate the median of the first ten prime numbers. ---------- 11=_____INT.

12. Calculate the perimeter of a regular octagon with sides that measure two hundred eighty-nine ten-thousandths meters. ----- 12=_____m

13. Six hundred fifty-two is what percent of five thousand, twenty-two. ---------- 13=_____%

14. $(44)[79 \times 46 \times 85]$ ---------- 14=_____

15. $(866/480)[697 - 926]$ ---------- 15=_____

16. $(570 + 496)[212 - 470 - 280]$ ---------- 16=_____

17. $\left[\frac{190}{67}\right][(92/56) + 1.53]$ ---------- 17=_____

18. $\left[\frac{141/200}{207/206}\right]\{1.59 + 1.1 - 1.25\}$ ---------- 18=_____

19. $\frac{[0.19/(0.0459)]/381}{(65.9 \times 244)(0.14)}$ ---------- 19=_____

20. $(0.0278)[166/281 \times 382/285] - 0.013$ ---------- 20=_____

21. $\frac{228}{(293 - 65)} - \frac{(233 - 251)}{41}$ ---------- 21=_____

22. $\frac{[-(528 + 111)(917 - 1020)]}{(0.0723/(38.8))}$ ---------- 22=_____

23. $\frac{(\pi)(86/336)(166/266)}{(264/72)}$ ---------- 23=_____

24. Calculate the number of liters in a fifty-five gallon drum. --------- 24=_____l

25. An inheritance is shared between Tim, Tom, and Tina in a ratio of 2:3:5 respectively. If Tom received $34,500, calculate the amount that Tina received. ---------- 25$_____

26. Calculate the area of a square with a diagonal that has a length of six and seventy-two hundredths inches. ---------- 26=_____in.

27. $[1250 - (790 + 1430)] + [(-7.14)(745 - 708)]$ ---------- 27=_____

28. $\dfrac{(39.3 - 38.3)(0.684 + 1.31)}{(1.52\text{x}10^{12})}$ ---------- 28=_____

29. $(0.0125)[[1.56/(1.35)][0.0908/(0.0231)]]$ ---------- 29=_____

30. $\dfrac{(10.3 + 12.3)}{(7.25\text{x}10^{10})}$ ---------- 30=_____

31. $\dfrac{1}{0.02} + \dfrac{1}{(\pi)(0.0209 - 0.00482)}$ ---------- 31=_____

32. $(2.18)\left[(1.13\text{x}10^{9}) - (3.39\text{x}10^{8})\right]$ ---------- 32=_____

33. $\left[\dfrac{1/143}{1/182}\right] + [0.981]$ ---------- 33=_____

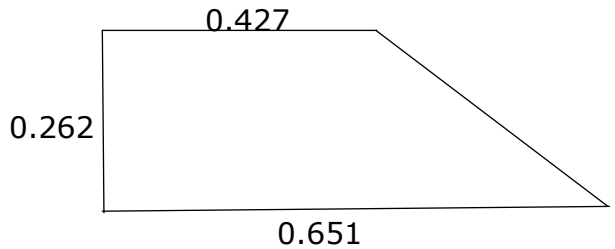
34. $\left[\dfrac{1/166}{1/28}\right][2.61\text{x}10^{6}]$ ---------- 34=_____

35. Stacy has $15.76 left after she spent $4.56 on lunch, gave $1.25 to her friend in need and spending $5 at the arcade. Calculate the amount of money she started with. ---------- 35=$_____

36. In 2010, 17 students were on the GMS Math/Science Team. Because of the hard work and success of the team, by 2020 the team had increased to 98 students. Calculate the percent increase in the size of the GMS Math/Science Team. ---------- 36=_____%

37.

TRAPEZOID

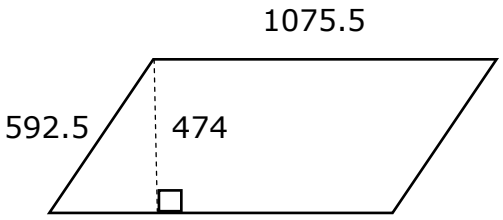


Area = ?

37=_____

38.

PARALLELOGRAM



Perimeter = ?

38=_____

39. $\left[\frac{1470 + (1/(0.00108))}{(1680/519) - 1.46}\right]^2$ ---------- 39=_____

40. $(2.23 + 10.7 + 10.5)^2(0.0643 + 0.123)^2$ ---------- 40=_____

41. $\sqrt[4]{\frac{2.27 + 1.58}{31.3 - 28.5}}$ ---------- 41=_____

42. $(151)\sqrt{244 + 437 + 468}$ ---------- 42=_____

43. $\sqrt{130} + \sqrt{283 + 291} - (\pi)\sqrt{715}$ ---------- 43=_____

44. $(1/(0.00152))(20300 - 2910)^3$ ---------- 44=_____

45. $(93.7)\sqrt{14400 + 13700 - 5080}$ ---------- 45=_____

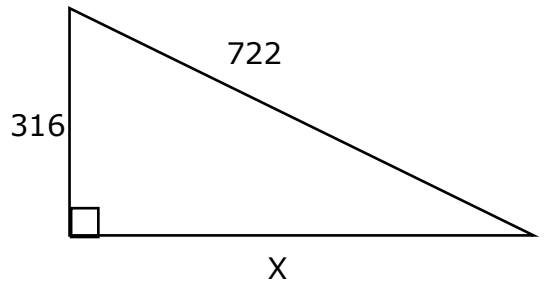
46. $\frac{1}{\sqrt{1450 + 1000 + 452}} + \left(\frac{1}{\sqrt{8.22}}\right)^3$ ---------- 46=_____

47. Rectangles A and B are similar. Rectangle A has a length of 15 in. and a width of 7 in. If Rectangle B has a length of 22 in. Calculate the area of Rectangle B. ---------- 47=_____$in.^2$

48. A circle and a square have the same area. If the radius of the circle is 29.7 cm, calculate the length of a side of the square in cm. --- 48=_____cm

49.

RIGHT TRIANGLE

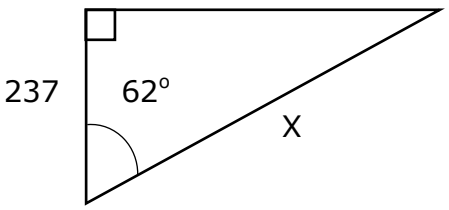


X = ?

49=_____

50.

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{\sqrt{\sqrt{0.172 - 0.159}}}{-(0.782 - 0.198)}\right]^3 [0.265 + 0.143]$ ---------- 51=_____

52. $\sqrt{\frac{1.79\text{x}10^5}{(5.18)(12.5)} + \frac{(1.85 - 7.51)}{(0.0202 + 0.0204)}}$ ---------- 52=_____

53. $\left[\frac{1620 - 409 + \sqrt{1.70\text{x}10^8/124}}{-5.17 + 8.93}\right]^{-2}$ ---------- 53=_____

54. $\sqrt{\frac{(6440)(18700)}{(19000)(3.47\text{x}10^5)}} - 0.114 + 0.0821$ ---------- 54=_____

55. $9800 + \sqrt{(13400)(3550)} - (18800 + 17600)$ ---------- 55=_____

56. $(20.9)^2 \sqrt{(1.58)/(5.29)} - (136 + 39.1)$ ---------- 56=_____

57. $(\text{rad}) \tan(242) + (249/96.7)$ ---------- 57=_____

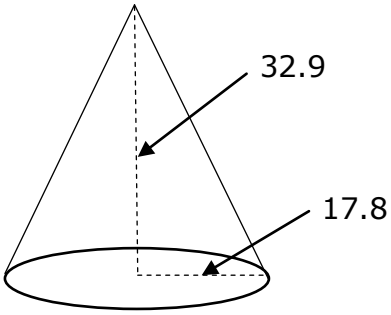
58. $\sqrt{\frac{1/(180 - 99.7)}{(725)(6670 + 7050)^{-3}}}$ ---------- 58=_____

59. Two supplementary angles are such that one angle is twenty-six degrees less than two times the second angle. Calculate the measure of the smaller angle in degrees. ---------- 59=_____ ^{o}

60. Calculate the final temperature when 85.5 g of water at 22.8^o C is mixed with 100 g of water at 54.7^o C. ---------- 60=_____ ^{o}C

61.

CONE

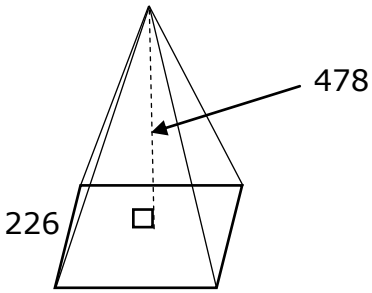


Total Surface Area = ?

61=_____

62.

SQUARE BASE PYRAMID



Volume = ?

62=_____

63. $\frac{25!/18!}{12! + 11!}$ ---------- 63=_____

64. $(2.48\text{x}10^{7} - 4.23\text{x}10^{6})^{-6}(2.33\text{x}10^{6})$ ---------- 64=_____

65. (deg) $(323 + 319)\sin(230°)$ ---------- 65=_____

66. (rad) $\tan\left[\frac{(0.587)(\pi)}{(19.3)(0.335)}\right]$ ---------- 66=_____

67. (deg) $\tan(0.44° - 1.48°) + 0.0132$ ---------- 67=_____

68. (deg) $\frac{\tan(24°)}{0.282 + 2.27}$ ---------- 68=_____

69. (deg) $\frac{\sin(1.42°) - \tan(1.42°)}{\sin(1.42°)}$ ---------- 69=_____

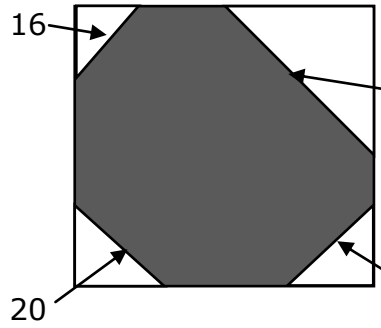
70. $(273 - 121)e^{\pi - 0.405}$ ---------- 70=_____

71. Calculate the odds of drawing a face card from a standard deck of playing cards. ---------- 71=_____

72. Mr. Detroth has a class of twenty-two students. Calculate the number of ways possible to make a group of seven from his class. 72=_____INT.

73.

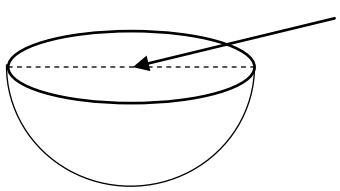
SQUARE AND ISOSCELES TRIANGLES



73=_____

74.

HEMISPHERE



Volume = ?

74=_____

75. $\frac{\text{Log}(1290 + 608)}{39300 - 45200}$ ---------- 75=_____

76. $\frac{0.066 + \sqrt{(0.052)(0.0499)} + (0.103)(0.985)}{\sqrt{\sqrt{0.0745 + 0.0247}}}$ ---------- 76=_____

77. $2\text{Log}\sqrt{\frac{(288)(\pi)}{0.651 + 0.587}}$ ---------- 77=_____

78. $\frac{\text{Log}[74.2 + (43.4)(9.83)]}{0.0694 + \text{Log}[0.992 + 0.737]}$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 698$ ---------- 79=_____

80. $1 + \frac{(0.62)^4}{2} - \frac{(0.62)^6}{6} + \frac{(0.62)^8}{24} - \frac{(0.62)^{10}}{120}$ ---------- 80=_____

2020 – 2021 TMSCA Middle School Calculator Test 1 Answer Key

Page 1

1 = -2200
= -2.20×10^{3}

2 = 10.7
= 1.07×10^{1}

3 = -37.0
= -3.70×10^{1}

4 = -29.9
= -2.99×10^{1}

5 = 1140
= 1.14×10^{3}

6 = 279
= 2.79×10^{2}

7 = 5.04
= 5.04×10^{0}

8 = -8.17
= -8.17×10^{0}

9 = 5.67×10^{6}

10 = 7.43×10^{9}

11 = 12 INT.

12 = 0.231
= 2.31×10^{-1}

13 = 13.0
= 1.30×10^{1}

Page 2

14 = 1.36×10^{7}

15 = -413
= -4.13×10^{2}

16 = -574000
= -5.74×10^{5}

17 = 9.00
= 9.00×10^{0}

18 = 1.01
= 1.01×10^{0}

19 = 4.83×10^{-6}

20 = 0.00901
= 9.01×10^{-3}

21 = 1.44
= 1.44×10^{0}

22 = 3.53×10^{7}

23 = 0.137
= 1.37×10^{-1}

24 = 208
= 2.08×10^{2}

25 = $57,500.00

26 = 22.6
= 2.26×10^{1}

Page 3

27 = -1230
= -1.23×10^{3}

28 = 1.31×10^{-12}

29 = 0.0568
= 5.68×10^{-2}

30 = 3.12×10^{-10}

31 = 69.8
= 6.98×10^{1}

32 = 1.72×10^{9}

33 = 2.25
= 2.25×10^{0}

34 = 440000
= 4.40×10^{5}

35 = $26.57

36 = 476
= 4.76×10^{2}

37 = 0.141
= 1.41×10^{-1}

38 = 3340
= 3.34×10^{3}

Page 4

39 = 1.82×10^{6}

40 = 19.3
= 1.93×10^{1}

41 = 1.08
= 1.08×10^{0}

42 = 5120
= 5.12×10^{3}

43 = -48.6
= -4.86×10^{1}

44 = 3.46×10^{15}

45 = 14200
= 1.42×10^{4}

46 = 0.0610
= 6.10×10^{-2}

47 = 226
= 2.26×10^{2}

48 = 52.6
= 5.26×10^{1}

49 = 649
= 6.49×10^{2}

50 = 505
= 5.05×10^{2}

2020 – 2021 TMSCA Middle School Calculator Test 1 Answer Key

Page 5

51 = -0.0789
= -7.89×10^{-2}

52 = -86.8
= -8.68×10^{1}

53 = 2.49×10^{-6}

54 = 0.103
= 1.03×10^{-1}

55 = -19700
= -1.97×10^{4}

56 = 63.6
= 6.36×10^{1}

57 = 2.67
= 2.67×10^{0}

58 = 6660
= 6.66×10^{3}

59 = 68.7
= 6.87×10^{1}

60 = 40.0
= 4.00×10^{1}

Page 6

61 = 3090
= 3.09×10^{3}

62 = 8.14×10^{6}

63 = 4.67
= 4.67×10^{0}

64 = 3.08×10^{-38}

65 = -492
= -4.92×10^{2}

66 = 0.293
= 2.93×10^{-1}

67 = -0.00495
= -4.95×10^{-3}

68 = 0.174
= 1.74×10^{-1}

69 = -0.000307
= -3.07×10^{-4}

70 = 2350
= 2.35×10^{3}

71 = 0.300
= 3.00×10^{-1}

72 = 170544 INT.

Page 7

73 = 1720
= 1.72×10^{3}

74 = 1.42×10^{10}

75 = -0.000556
= -5.56×10^{-4}

76 = 0.389
= 3.89×10^{-1}

77 = 2.86
= 2.86×10^{0}

78 = 8.79
= 8.79×10^{0}

79 = 122000
= 1.22×10^{5}

80 = 1.07
= 1.07×10^{0}

TMSCA 2020-2021 MS CA Test 1 Solutions to Word and Geometry Problems

11. The median of ten numbers will be the average of 5th and 6th number in the list. Primes: 2,3,5,7,11,13,… The average of 11 and 13 is 12.0

12. 8(.0289)

13. $\frac{652}{5022} = \frac{n}{100}$;

$n = \frac{652(100)}{5022}$

24. On RPN HP calculator there is a key to convert gal to liters. Many calculators have similar keys. You may have to memorize that
3.79 L $\approx 1\ gal.$
3.79(55)

25. 3x = 34500; x = $\frac{34500}{3}$
Tina is 5x = $5\left(\frac{34500}{3}\right)$

26. A = $\frac{d^2}{2} = \frac{(6.72)^2}{2}$

35. 15.76 + 4.56 + 1.25 + 5
Be sure to look at digits to see the cents.

36. On HP RPN 17 enter 98 % chg key
Without RPN: $\frac{98-17}{17}\ (100)$

37. $\frac{(.427+.651)(.262)}{2}$

38. 2(1075.5 + 592.5)

47. $x = width\ of\ B$
$\frac{15}{7} = \frac{22}{x}; x = \frac{22(7)}{15}$
Area = 22x = $22\left(\frac{22(7)}{15}\right)$

48. Area of circle = $\pi(29.7)^2$ **=** area of square also.
Side of square = $\sqrt{\pi(29.7)^2}$

49. $\sqrt{722^2 - 316^2}$

50. $cos\ 62 = \frac{237}{x}$
$x = \frac{237}{\cos 62}$

59. angle A = A
Angle B = 2A – 26
A + 2A – 26 = 180
3A = 180 + 26; A = $\frac{180+26}{3}$
B = 180 - A

60. $\frac{85.5(22.8)+100(54.7)}{100+85.5}$

61. $\pi rs + \pi r^2$
$s = \sqrt{(17.8)^2 + (32.9)^2}$

$\pi(17.8)\left(\sqrt{(17.8)^2 + (32.9)^2}\right) + \pi(17.8)^2$

62. $\frac{1}{3}Bh = \frac{1}{3}(226)^2(478)$

71. There are 12 face cards and 40 that are not face cards. $\frac{12}{40}$

72. Combination of 22 choose 7

$$\frac{22!}{7!\,(22-7)!}$$

73. Isosceles triangle area =

$$\frac{d^2}{4} = \frac{hypotenuse^2}{4}$$

Side of square = $\frac{192}{4}$
Area =

$$\left(\frac{192}{4}\right)^2 - \frac{16^2}{4} - \frac{36^2}{4} - 2\left(\frac{20^2}{4}\right)$$

74. V = $\frac{2}{3}\pi r^3$; $r = \frac{3785}{2}$

V = $\frac{2}{3}\pi\left(\frac{3785}{2}\right)^3$

79. For the sum of even numbers beginning with 2, divide the last number by 2 and multiply the result by the next consecutive number.
$\frac{698}{2} = 349$
349(350) is the total from 2 to 698. The exact answer is the result, minus 2 since 2 is not included.