8

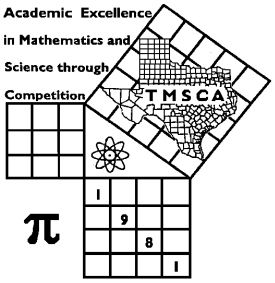
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 # 9 ©

J A N U A R Y 3 0, 2 0 2 1

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 #9

1. 4510 – 1140 ---------- 1=_____

2. 33 + 18 – 16 ---------- 2=_____

3. 2460 + 1420 – 1050 ---------- 3=_____

4. π + 4 – 17 – 5 ---------- 4=_____

5. 1270 + 5090 – 2800 – 836 ---------- 5=_____

6. –309 + 309 – 209 – 79.3 – 133 ---------- 6=_____

7. (3.14 + π – 1.6) – (3.14 + 6.01) ---------- 7=_____

8. 3.8 + 3.3 + 0.974 + π + 1.48 ---------- 8=_____

9. 45.3 x 181 x 130 ---------- 9=_____

10. 6350 x 5930 x 49.9 x 28.2 ---------- 10=_____

11. Mr. T's water meter read 13502 when the meter was read. His previous reading was 13444 and he was charged $45.40 for his water usage. Calculate the cost per unit of water used. --------- 11=$_____

12. The vertices of a right triangle have the coordinates (2,4); (8,4); and (2,0). Calculate the area in square units. ---------- 12=_____units^2

13. Convert 8ϖ/9 radians to degrees. ---------- 13=_____^{o}

14. $(362)[91 \times 553 \times 169]$ ---------- 14=_____

15. $58 - [60/55 + 2.86]$ ---------- 15=_____

16. $\{700/216\}\left[\frac{489}{253 + 916}\right]$ ---------- 16=_____

17. $\left[\frac{177}{168}\right][(677/372) + 0.269]$ ---------- 17=_____

18. $\frac{[0.538/(0.537)]/0.297}{(0.00293 \times 0.00492)(0.0789)}$ ---------- 18=_____

19. $\left[\frac{(1500/1640) - (2590/1190)}{0.176/(0.153)}\right]$ ---------- 19=_____

20. $\frac{(\pi)(8/53)(12/30)}{365}$ ---------- 20=_____

21. $\frac{(1380)(7.99 \times 10^{-4})}{2410}(0.00595 - 0.0123)$ ---------- 21=_____

22. $\left[\frac{958 + 1320}{820 - 1570}\right]\left[\frac{1300}{1540}\right]$ ---------- 22=_____

23. $\frac{(1200 \times 1230)/281}{(682 \times 21) + 13900}$ ---------- 23=_____

24. Bernadette is taking a full load of five college classes. Her averages are 95,78,92,99, and 85. Calculate the range of her averages. - 24=_____

25. In a 30-60-90 triangle, the hypotenuse measures 521.995 cm. Calculate the length of the smallest side of the triangle in cm. -- 25=_____cm

26. The measure of an angle is 35 less than 2 times its supplement. Calculate the measure of the angle. ---------- 26=_____°

27. $(0.0703)[[3.72/(5.76)][0.605/(0.534)]]$ ---------- 27=_____

28. $\dfrac{(0.0182 - 0.0192)(14.5 + 24.2)}{(3.63\text{x}10^{11})}$ ---------- 28=_____

29. $(279)[(153/147)(18.4 + 25.1)]$ ---------- 29=_____

30. $\dfrac{1}{-0.768} + \dfrac{1}{(\pi)(0.0747 - 0.473)}$ ---------- 30=_____

31. $[3.16]\left[\dfrac{1/0.00242}{1/(0.00114)}\right]$ ---------- 31=_____

32. $\dfrac{1}{54.6} + \dfrac{1}{(39.9 - 16.4)}$ ---------- 32=_____

33. $\dfrac{1}{154} - \dfrac{1}{150} + \dfrac{1}{209}$ ---------- 33=_____

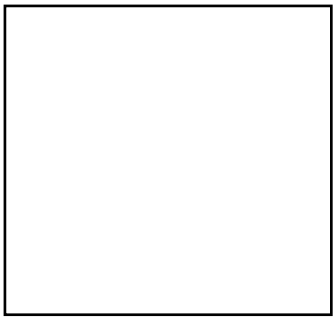
34. $\left[\dfrac{1/88.4}{1/20.3}\right] + [0.185]$ ---------- 34=_____

35. Calculate the multiplicative inverse of the opposite of the square root of e to the 50th power. ---------- 35=_____

36. The cruising speed of the North American XB-70 Valkyrie is an amazing 1988 miles per hour. Calculate this speed in the number of 100-yard football fields per second. ---------- 36=_____fields/sec.

37.

SQUARE



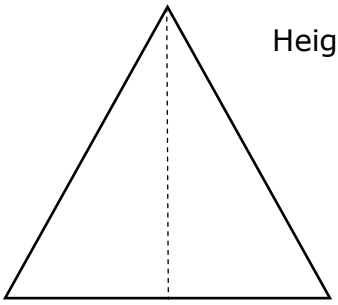
Perimeter = .00259

Area = ?

37=_____

38.

EQUILATERAL TRIANGLE



Height = 712000

Side = ?

38=_____

39. $\left[\frac{47.6}{10.5}\right](286 + 139)^3$ ---------- 39=_____

40. $(0.164 + 0.173)^2(0.281 + 0.468)^2$ ---------- 40=_____

41. $\left[\frac{2150 + (1/(3.70\text{x}10^{-4}))}{(2090/5350) - 0.361}\right]^2$ ---------- 41=_____

42. $\sqrt{(84.2/152) + 0.489 - 0.428}$ ---------- 42=_____

43. $\sqrt{1270} + \sqrt{1710 + 1120} - (\pi)\sqrt{4500}$ ---------- 43=_____

44. $\sqrt{226 - 97.3 + 95} - \sqrt{146}$ ---------- 44=_____

45. $\frac{(1760 + 1550)^{1/4}}{(11000 - 10200)^{1/2}}$ ---------- 45=_____

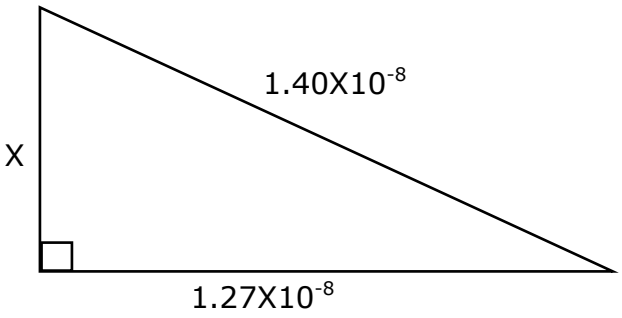
46. $(21.9)\sqrt[3]{268 + 446 - 61.6}$ ---------- 46=_____

47. A bicycle tire rotates 9,170 times during a 10-mile bike ride. To the nearest inch, calculate the outside diameter of the tire. ---------- 47=_____INT.

48. Brianna traveled from home to the big city at an average speed of 53 miles per hour. Her return trip took 45 minutes less as she averaged 67 mph. Calculate how far the big city is from Bri's house. ---------- 48=_____mi.

49.

RIGHT TRIANGLE

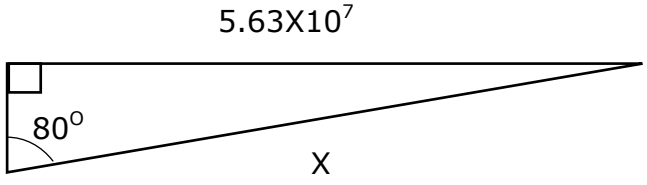


X = ?

49=_____

50.

RIGHT TRIANGLE



X = ?

50=_____

51. $\dfrac{(5550 + 6930 - 6680)^3}{\sqrt{2.85\text{x}10^5 + 5.09\text{x}10^5 + 3.92\text{x}10^5}}$ ---------- 51=_____

52. $\left[\dfrac{548 - 187 + \sqrt{3.15\text{x}10^7/561}}{-3.23 + 9.75}\right]^4$ ---------- 52=_____

53. $\dfrac{\sqrt{8 + \pi + 21.7}}{(1.32\text{x}10^5 - 2.23\text{x}10^5 + 1.43\text{x}10^5)^3}$ ---------- 53=_____

54. $(0.095)(3.43\text{x}10^{10})^{1/2} - [(11800)(18400)]^{1/2}$ ---------- 54=_____

55. $\sqrt{\dfrac{(2.27\text{x}10^5)(1.13\text{x}10^5)}{(1.31\text{x}10^5)(12300)}} - 3.48 + 0.724$ ---------- 55=_____

56. $956 + \sqrt{(152)(1030)} - (157 + 604)$ ---------- 56=_____

57. $\sqrt{\dfrac{(4.04)(1740)}{(32.2) + (29.2)}} - 22.6$ ---------- 57=_____

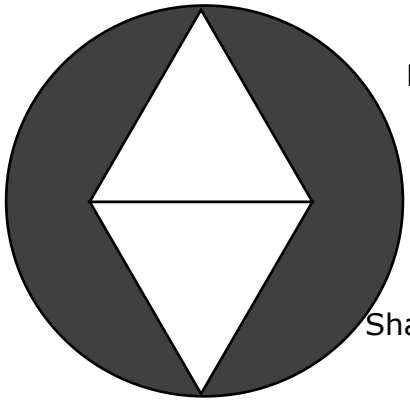
58. $(\text{rad})\cos(322) + (836/150)$ ---------- 58=_____

59. Calculate the area of a regular dodecagon with a side length of 5.662 centimeters and an apothem of 10.565 centimeters. ------ 59=_____cm^2

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

61.

CIRCLE AND EQUIVALENT EQUILATERAL TRIANGLES



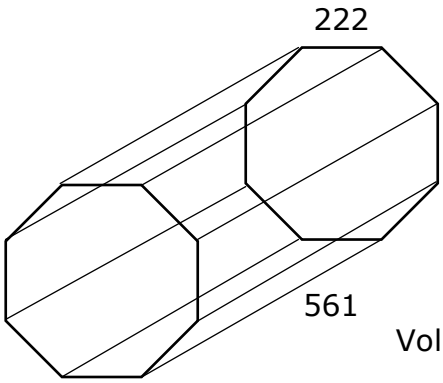
Radius = 5.36

Shaded Area = ?

61=_____

62.

REGULAR RIGHT OCTAGONAL PRISM



Volume = ?

62=_____

63. $\frac{24! + 23!}{11!}$ ---------- 63=_____

64. $(7.38\text{x}10^{6} - 1.65\text{x}10^{7})^{-8}(35700)$ ---------- 64=_____

65. (deg) $(577 + 2110)\cos(4.85°)$ ---------- 65=_____

66. (deg) $[94]\cos(4.15° - 6.46°)$ ---------- 66=_____

67. (rad) $\cos\left[\frac{(27.9)(\pi)}{(278)(370)}\right]$ ---------- 67=_____

68. (deg) $\frac{\tan(41.6°)}{3.44 + 1.93}$ ---------- 68=_____

69. (deg) $\frac{\sin(44.2°) - \tan(44.2°)}{\sin(44.2°)}$ ---------- 69=_____

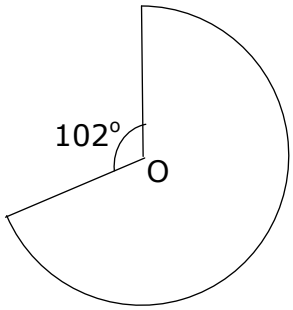
70. $(256 - 254)^{0.135 - 0.108}$ ---------- 70=_____

71. Calculate the number of years it would take to turn \$1,000 into \$10,000 at 5% interest compounded annually. ---------- 71=_____yrs.

72. The sum of the digits in a three-digit integer is 19. The hundreds digit is 1/3 the units digit and the units digit is one less than the sum of the other 2 digits. Calculate the 3 digit integer. ---------- 72=_____INT.

73.

SECTOR OF A CIRCLE



Center of circle O

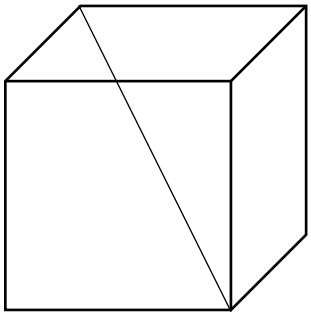
Area of Sector = 9.71×10^{8}

Radius = ?

73=_____

74.

CUBE



Inner Diagonal = 2009

Volume = ?

74=_____

75. $\text{Ln}\left[\dfrac{50.4 + 30.4 + 83.9}{402 + 378 - 226}\right]$ ---------- 75=_____

76. $\dfrac{2.44 + \sqrt{(\pi)(2.06) + (0.293)(14.8)}}{\sqrt{\sqrt{0.0148 + 0.00952}}}$ ---------- 76=_____

77. $(1040)10^{(0.412)(5.53)}$ ---------- 77=_____

78. $\dfrac{\text{Log}[343 + (47.9)(48.6)]}{2.26 + \text{Log}[185 + 258]}$ ---------- 78=_____

79. $1 + 3 + 5 + \ldots + 691$ ---------- 79=_____

80. $1 + (0.56) + \dfrac{(0.56)^2}{2} + \dfrac{(0.56)^3}{6} + \dfrac{(0.56)^4}{24}$ ---------- 80=_____

2020 – 2021 TMSCA Middle School Calculator Test 9 Answer Key

Page 1

1 = 3370
= 3.37×10^{3}

2 = 35.0
= 3.50×10^{1}

3 = 2830
= 2.83×10^{3}

4 = -14.9
= -1.49×10^{1}

5 = 2720
= 2.72×10^{3}

6 = -421
= -4.21×10^{2}

7 = -4.47
= -4.47×10^{0}

8 = 12.7
= 1.27×10^{1}

9 = 1.07×10^{6}

10 = 5.30×10^{10}

11 = $0.78

12 = 12.0
= 1.20×10^{1}

13 = 160
= 1.60×10^{2}

Page 2

14 = 3.08×10^{9}

15 = 54.0
= 5.40×10^{1}

16 = 1.36
= 1.36×10^{0}

17 = 2.20
= 2.20×10^{0}

18 = 2.97×10^{6}

19 = -1.10
= -1.10×10^{0}

20 = 0.000520
= 5.20×10^{-4}

21 = -2.91×10^{-6}

22 = -2.56
= -2.56×10^{0}

23 = 0.186
= 1.86×10^{-1}

24 = 21.0
= 2.10×10^{1}

25 = 261
= 2.61×10^{2}

26 = 108
= 1.08×10^{2}

Page 3

27 = 0.0514
= 5.14×10^{-2}

28 = -1.07×10^{-13}

29 = 12600
= 1.26×10^{4}

30 = -2.10
= -2.10×10^{0}

31 = 1.49
= 1.49×10^{0}

32 = 0.0609
= 6.09×10^{-2}

33 = 0.00461
= 4.61×10^{-3}

34 = 0.415
= 4.15×10^{-1}

35 = -1.39×10^{-11}

36 = 9.72
= 9.72×10^{0}

37 = 4.19×10^{-7}

38 = 822000
= 8.22×10^{5}

Page 4

39 = 3.48×10^{8}

40 = 0.0637
= 6.37×10^{-2}

41 = 2.68×10^{10}

42 = 0.784
= 7.84×10^{-1}

43 = -122
= -1.22×10^{2}

44 = 2.87
= 2.87×10^{0}

45 = 0.268
= 2.68×10^{-1}

46 = 190
= 1.90×10^{2}

47 = 22 INT.

48 = 190
= 1.90×10^{2}

49 = 5.89×10^{-9}

50 = 5.72×10^{7}

2020 – 2021 TMSCA Middle School Calculator Test 9 Answer Key

Page 5

51 = 1.79×10^{8}

52 = 7.07×10^{7}

53 = 4.08×10^{-14}

54 = 2860
= 2.86×10^{3}

55 = 1.23
= 1.23×10^{0}

56 = 591
= 5.91×10^{2}

57 = -11.9
= -1.19×10^{1}

58 = 5.59
= 5.59×10^{0}

59 = 359
= 3.59×10^{2}

60 = 0.167
= 1.67×10^{-1}

Page 6

61 = 57.1
= 5.71×10^{1}

62 = 1.33×10^{8}

63 = 1.62×10^{16}

64 = 7.46×10^{-52}

65 = 2680
= 2.68×10^{3}

66 = 93.9
= 9.39×10^{1}

67 = 1.00
= 1.00×10^{0}

68 = 0.165
= 1.65×10^{-1}

69 = -0.395
= -3.95×10^{-1}

70 = 1.02
= 1.02×10^{0}

71 = 47.2
= 4.72×10^{1}

72 = 379 INT.

Page 7

73 = 20800
= 2.08×10^{4}

74 = 1.56×10^{9}

75 = -1.21
= -1.21×10^{0}

76 = 23.6
= 2.36×10^{1}

77 = 197000
= 1.97×10^{5}

78 = 0.698
= 6.98×10^{-1}

79 = 120000
= 1.20×10^{5}

80 = 1.75
= 1.75×10^{0}

TMSCA 2020-2021 MS CA Test 9 Solutions to Word and Geometry Problems

11. $\frac{45.40}{13502-13444}$

12. $\frac{6(4)}{2}$

13. $\pi\ radians = 180\ degrees$

$\frac{8\pi}{9} = \frac{8(180)}{9}$ or some calculators have a conversion key.

24. 99-78

25. Smallest side is half of hypotenuse. $\frac{521.995}{2}$

26. Angle = x

Supplement = 180 – x

$$x = 2(180 - x) - 35$$
$$x = 360 - 2x - 35$$
$$3x = 325; x = \frac{325}{3}$$

35. $\frac{1}{-\sqrt{e^{50}}}$

36.

$$\frac{1988m}{1hr} \cdot \frac{1hr}{3600\ sec} \cdot \frac{1760\ yd}{1\ m} \cdot \frac{1\ field}{100\ yd}$$

37. side = $\frac{.00259}{4}$

Area = $side^2 = \left(\frac{.00259}{4}\right)^2$

38. $\frac{2(712000)}{\sqrt{3}}$

47.

$$9170\pi d = 10(5280)(12)$$
$$d = \frac{10(5280)(12)}{9170\pi}$$

48.

	rate	time	dist
to	53	x	53x
from	67	x-.75	67(x-.75)

$$53x = 67(x - .75)$$
$$53x = 67x - 50.25$$
$$-14x = -50.25$$
$$x = \frac{-50.25}{-14}$$

This is time. To get distance

$$53\left(\frac{-50.25}{-14}\right)$$

49.

$$\sqrt{(1.4\ x\ 10^{-8})^2 - (1.27\ x\ 10^{-8})^2}$$

50. $\frac{sin\ 80}{1} = \frac{5.63\ x\ 10^7}{x}$

$$x = \frac{5.63\ x\ 10^7}{\sin 80}$$

59. A = $\frac{1}{2}aP$

$$Area = \frac{1}{2}(10.565)(12)(5.662)$$

60. $\frac{1+2+3}{36}$

61. $\pi r^2 - 2\left[\frac{r^2\sqrt{3}}{3}\right]$

$$\pi(5.36)^2 - 2\left[\frac{(5.36)^2\sqrt{3}}{3}\right]$$

62. V = Bh where B is the area of the octagon. A neat formula for area of any regular polygon is $\frac{Perimeter^2}{\left(\tan\frac{180}{n}\right)(4n)}$ where n = number of sides of polygon

62. contd.

V = $\frac{[222(8)]^2}{\left(tan\frac{180}{8}\right)(32)} \cdot 561$

71. $10000 = 1000(1.05)^x$

$$10 = (1.05)^x$$

Take Log of both sides.

$$Log\ 10 = xLog\ 1.05$$
$$x = \frac{Log\ 10}{Log\ 1.05}$$

72. $\left\{\begin{matrix} a + b + c = 19 \\ a = \frac{1}{3}c; so\ c = 3a \\ c = a + b - 1 \end{matrix}\right\}$

Substituting 3a for c

$$\left\{\begin{matrix} 3a = a + b - 1 \\ a + b + 3a = 19 \end{matrix}\right\}$$
$$\left\{\begin{matrix} 2a - b = -1 \\ 4a + b = 19 \end{matrix}\right\}$$

Add these to get $6a = 18; a = 3.\ c = 3a\ so\ c = 9$

3+b+9=19 so b = 7.

Answer for abc is 379.

73. Central angle = 360 – 102 = 258 degrees.

$$\frac{258}{360}(\pi r^2) = 9.71\ x\ 10^8$$

$$r = \sqrt{(9.71\ x\ 10^8)\left(\frac{360}{258}\right)\left(\frac{1}{\pi}\right)}$$

74. Side = $\frac{d}{\sqrt{3}}$; $V = side^3$

$$V = \left(\frac{2009}{\sqrt{3}}\right)^3$$