8

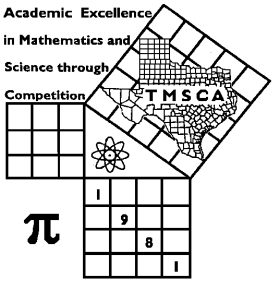
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #7 ©

JANUARY 18, 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 #7

1. 2530 – 1080 ---------- 1=_____

2. 33 – 65 – 34 ---------- 2=_____

3. 735 + 691 + 156 ---------- 3=_____

4. 45 – 58 + 38 – π ---------- 4=_____

5. –555 – 284 – 633 – 721 ---------- 5=_____

6. 162 + 28.5 – 74.6 – 132 – 175 ---------- 6=_____

7. 4.83 + 5.26 + 5.78 + 2.37 + 4.78 ---------- 7=_____

8. 3.54 – 4.66 + 2.31 – 0.994 – 5.45 ---------- 8=_____

9. 80.2 x 150 x 73.2 ---------- 9=_____

10. 2410 x 198 x 90 x 976 ---------- 10=_____

11. Calculate the product of two thousand five hundred two and two and seven ten-thousandths. ---------- 11=_____

12. The worlds record for longest hair among teenagers 13 – 17 was 5.5 feet. Convert this to centimeters. ---------- 12=_____cm

13. Calculate the range of the set that contains all of the two-digit prime numbers. ---------- 13=_____INT.

14. (237)[101 x 167 x 68] ---------- 14=_____

15. 357/[562 x 71 x 469] ---------- 15=_____

16. {(64)(85 – 108)(70)} – 77300 ---------- 16=_____

17. $\{117/125\}\left[\frac{126}{112 + 57}\right]$ ---------- 17=_____

18. $\frac{[0.172/(0.0428)]/0.013}{(5.32 \times 13.9)(72.6)}$ ---------- 18=_____

19. $\left[\frac{(440/887) - (787/166)}{29.6/(8.66)}\right]$ ---------- 19=_____

20. $\frac{(0.02)(0.0152)}{0.00808}(182 - 96.8)$ ---------- 20=_____

21. (0.143)[360/95 x 166/573] – 0.0574 ---------- 21=_____

22. $\frac{[-(731 + 565)(919 - 652)]}{(0.108/(70))}$ ---------- 22=_____

23. $\left[\frac{5950 + 5620}{5440 - 5900}\right]\left[\frac{6030}{6740}\right]$ ---------- 23=_____

24. Rick wants to save $2,500 for a down payment on a new car. Calculate how much he would have to save out of each paycheck every two weeks to accomplish his goal in one year. ---------- 24=$_____

25. If Set R has 36 elements, Set S has 40 elements, and the union of R & S has 42 elements, calculate the number of elements in the intersection of R & S. ---------- 25=_____INT.

26. If $f(x) = 5x^7 - 21$ and $g(x) = 2x^4 - 4x$, calculate f(g(3)). --------- 26=_____

27. $\dfrac{(6.00\text{x}10^{10}) + (1.36\text{x}10^{10})}{(-1.16)(2.99) - 0.521}$ ---------- 27=_____

28. $\dfrac{(10.6 + 6.27)(0.0963 + 0.0709)}{(1.73\text{x}10^{11})}$ ---------- 28=_____

29. $\dfrac{(0.0126 - 0.0127)(0.0266 + 0.0612)}{(2.26\text{x}10^{11})}$ ---------- 29=_____

30. $\dfrac{(0.0299 + 0.0317)}{(4.48\text{x}10^{11})}$ ---------- 30=_____

31. $(33.2)\left[(9.91\text{x}10^{7}) - (1.50\text{x}10^{8})\right]$ ---------- 31=_____

32. $\dfrac{1}{-0.0848} + \dfrac{1}{(0.021 - 0.0764)}$ ---------- 32=_____

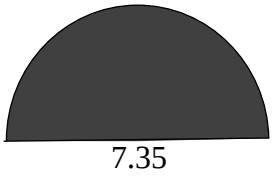
33. $\dfrac{1}{5710} - \dfrac{1}{4570} + \dfrac{1}{6060}$ ---------- 33=_____

34. $\dfrac{1}{114} - \dfrac{1}{(82.2 + 117)}$ ---------- 34=_____

35. The interior angles in a pentagon are in the ratio of 5:3:4:6:4.
Calculate the measure of the smallest angle. ---------- 35=_____°

36. Calculate the slope of the line given by the equation
$5x + 2y = 17$ ---------- 36=_____

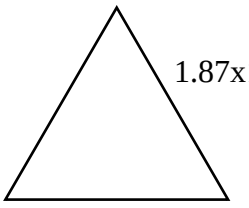
SEMICIRCLE



Area = ?

37=_____

EQUILATERAL TRIANGLE



Height = ?

38=_____

39. $(476 + 108 + 128)^2(53.8 + 65.5)^2$ ---------- 39=_____

40. $\left[\frac{1220 + (1/(8.65x10^{-4}))}{(683/1140) - 0.406}\right]^2$ ---------- 40=_____

41. $\frac{(63900 + 27900)^3}{(0.209 - 0.161)^2}$ ---------- 41=_____

42. $(1/(4.84x10^{-4}))(6530 - 2850)^2$ ---------- 42=_____

43. $(21800)\sqrt{413 + 530 + 803}$ ---------- 43=_____

44. $\sqrt{898 - 334 + 1220} - \sqrt{1280}$ ---------- 44=_____

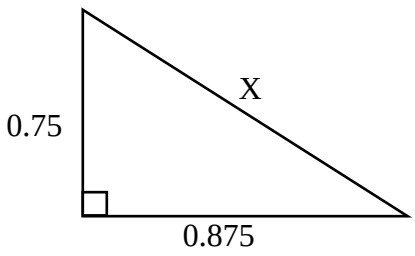
45. $(4920)\sqrt[3]{54700 + 7920 - 6530}$ ---------- 45=_____

46. $\left[\sqrt{(30.6/22.6)(828)}\right]^3$ ---------- 46=_____

47. The number 34341 Base 5 has what value in Base 10. ---------- 47=_____INT.

48. If the diagonal of one face of a cube is 22.8 inches, calculate the surface area. ---------- 48=_____$in.^2$

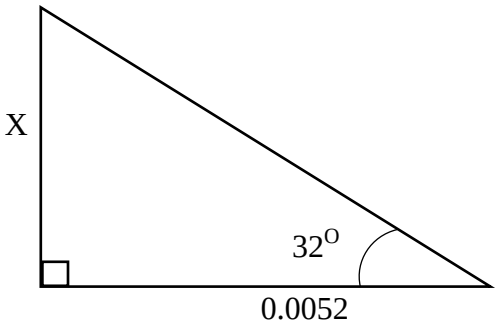
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{\sqrt{\sqrt{1.54 - 0.891}}}{-(30700 - 28600)}\right]^3 [25.4 + 18.6]$ ---------- 51=_____

52. $\frac{(0.00257 + 0.00588 - 0.00403)^2}{\sqrt{2040 + 2680 + 6300}}$ ---------- 52=_____

53. $\frac{\sqrt{20.7 + \pi + 56.9}}{(0.194 - 0.181 + 0.16)^4}$ ---------- 53=_____

54. $(2.42)(2.78 \times 10^8)^{1/2} - [(2.50 \times 10^8)(3.60 \times 10^9)]^{1/4}$ ------ 54=_____

55. $\sqrt{\frac{1/(762 - 264)}{(26.4)(182 + 247)^5}}$ ---------- 55=_____

56. $\sqrt{\frac{(2610)(21300)}{(1.25 \times 10^5)(1.53 \times 10^5)}} - 0.0132 + 0.0476$ ---------- 56=_____

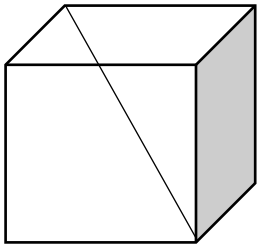
57. $\sqrt{\frac{(1860)(134)}{(1000) + (892)}} - 32.1$ ---------- 57=_____

58. $\sqrt{\frac{(37.7)(47.7)}{(29.5) + (35.3)}} + 1/(2.29)^{-2}$ ---------- 58=_____

59. The odds of winning a race is 15 to 8. Calculate the probability of winning the race. ---------- 59=_____

60. Calculate the measure of one interior angle of a regular polygon with 48 sides. ---------- 60=_____

CUBE

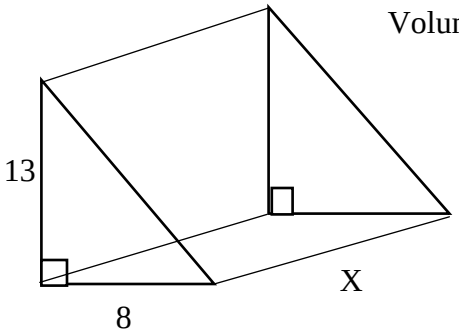


Inner Diagonal = 17.81

Volume = ?

61=_____

RIGHT TRIANGULAR PRISM



Volume = 611

X = ?

62=_____

63. $\frac{21!}{5!}$ ---------- 63=_____

64. $(1.66\text{x}10^{7} - 4.52\text{x}10^{7})^{-8}(16000)$ ---------- 64=_____

65. (deg) $(5.66 - 11.4)\sin(34.8°)$ ---------- 65=_____

66. (rad) $\frac{\tan(425)}{213/564}$ ---------- 66=_____

67. (deg) $\sin(7.56° - 3.29°) + 0.0363$ ---------- 67=_____

68. (rad) $(4810)\tan(80.3)$ ---------- 68=_____

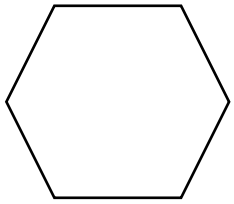
69. (deg) $\frac{\sin(172°) - \tan(172°)}{\sin(172°)}$ ---------- 69=_____

70. $(70 + 19.4 + 37.4)^{3/5}$ ---------- 70=_____

71. Tracey travels an average of sixty-five miles per hour to a destination and an average of eighty miles per hour back. Calculate the average speed for the entire trip. ---------- 71=_____mph.

72. The distance in feet it takes for a certain vehicle to stop varies directly as the square of the speed it is traveling. If the stopping distance is 300 feet at 55 mph., calculate the stopping distance at 80 mph. ---------- 72=_____ft.

REGULAR HEXAGON

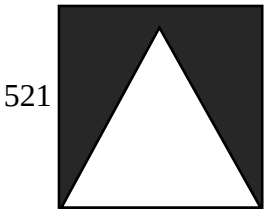


Perimeter = 20502

Area = ?

73=_____

SQUARE AND EQUILATERAL TRIANGLE



Shaded Area = ?

74=_____

75. $\dfrac{1.24 + \sqrt{(0.804)(1.45)} + (0.287)(5.33)}{\sqrt{\sqrt{3.39 + 3.97}}}$ ---------- 75=_____

76. $\text{Ln}\left[\dfrac{406 + 164 + 412}{148 + 137 - 30.1}\right]$ ---------- 76=_____

77. $\text{Log}\sqrt{\dfrac{278 - 159}{(8.61)(8.41)}}$ ---------- 77=_____

78. $(1.26)^{\pi}(0.634)^{5}(0.436 - 0.19)^{3}$ ---------- 78=_____

79. $2 + 4 + 6 + \ldots + 842$ ---------- 79=_____

80. $(0.519) - \dfrac{(0.519)^2}{2} + \dfrac{(0.519)^3}{3} - \dfrac{(0.519)^4}{4}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #7 Answer Key

Page 1

1 = 1450
= 1.45×10^{3}

2 = -66.0
= -6.60×10^{1}

3 = 1580
= 1.58×10^{3}

4 = 21.9
= 2.19×10^{1}

5 = -2190
= -2.19×10^{3}

6 = -191
= -1.91×10^{2}

7 = 23.0
= 2.30×10^{1}

8 = -5.25
= -5.25×10^{0}

9 = 881000
= 8.81×10^{5}

10 = 4.19×10^{10}

11 = 5010
= 5.01×10^{3}

12 = 168
= 1.68×10^{2}

13 = 86 INT.

Page 2

14 = 2.72×10^{8}

15 = 1.91×10^{-5}

16 = -180000
= -1.80×10^{5}

17 = 0.698
= 6.98×10^{-1}

18 = 0.0576
= 5.76×10^{-2}

19 = -1.24
= -1.24×10^{0}

20 = 3.21
= 3.21×10^{0}

21 = 0.0996
= 9.96×10^{-2}

22 = -2.24×10^{8}

23 = -22.5
= -2.25×10^{1}

24 = $96.15

25 = 34 INT.

26 = 8.54×10^{15}

Page 3

27 = -1.84×10^{10}

28 = 1.63×10^{-11}

29 = -3.88×10^{-17}

30 = 1.38×10^{-13}

31 = -1.69×10^{9}

32 = -29.8
= -2.98×10^{1}

33 = 0.000121
= 1.21×10^{-4}

34 = 0.00375
= 3.75×10^{-3}

35 = 73.6
= 7.36×10^{1}

36 = -2.50
= -2.50×10^{0}

37 = 21.2
= 2.12×10^{1}

38 = 162000
= 1.62×10^{5}

Page 4

39 = 7.22×10^{9}

40 = 1.51×10^{8}

41 = 3.36×10^{17}

42 = 2.80×10^{10}

43 = 911000
= 9.11×10^{5}

44 = 6.46
= 6.46×10^{0}

45 = 188000
= 1.88×10^{5}

46 = 37500
= 3.75×10^{4}

47 = 2471 INT.

48 = 1560
= 1.56×10^{3}

49 = 1.15
= 1.15×10^{0}

50 = 0.00325
= 3.25×10^{-3}

2019-2020 TMSCA Middle School Calculator Test #7 Answer Key

Page 5

51 = -3.44×10^{-9}

52 = 1.86×10^{-7}

53 = 10000
= 1.00×10^{4}

54 = 9550
= 9.55×10^{3}

55 = 2.29×10^{-9}

56 = 0.0883
= 8.83×10^{-2}

57 = -20.6
= -2.06×10^{1}

58 = 10.5
= 1.05×10^{1}

59 = 0.652
= 6.52×10^{-1}

60 = 173
= 1.73×10^{2}

Page 6

61 = 1090
= 1.09×10^{3}

62 = 11.8
= 1.18×10^{1}

63 = 4.26×10^{17}

64 = 3.57×10^{-56}

65 = -3.28
= -3.28×10^{0}

66 = 3.24
= 3.24×10^{0}

67 = 0.111
= 1.11×10^{-1}

68 = -25100
= -2.51×10^{4}

69 = 2.01
= 2.01×10^{0}

70 = 18.3
= 1.83×10^{1}

71 = 71.7
= 7.17×10^{1}

72 = 635
= 6.35×10^{2}

Page 7

73 = 3.03×10^{7}

74 = 154000
= 1.54×10^{5}

75 = 2.34
= 2.34×10^{0}

76 = 1.35
= 1.35×10^{0}

77 = 0.108
= 1.08×10^{-1}

78 = 0.00315
= 3.15×10^{-3}

79 = 178000
= 1.78×10^{5}

80 = 0.413
= 4.13×10^{-1}

TMSCA 19-20 MS CA Test #7 Solutions to Word and Geometry Problems

11. 2502(2.0007)

12. 5.5(12) = inches
Some calculators will convert to cm. Otherwise:
5.5(12)(2.54)

13. 11 is the lowest 2-digit prime. 97 is the highest 2-digit prime. 97 – 11

24. $\frac{2500}{26}$

25. $n(R \cup S) = n(R) + n(S) - n(R \cap S)$
42 = 36 + 40 – $n(R \cap S)$

$$n(R \cap S) = 36 + 40 - 42$$

26.
g(3) = $2(3^4) - 4(3) = 150$
f(g(3)) = $5(150^7) - 21$

35. degrees inside a pentagon = 180(n-2) = 180(3) = 540.
$5x + 3x + 4x + 6x + 4x = 540$
$x = \frac{540}{22}$ Smallest angle is 3x.

36. $5x + 2y = 17$ is the form $ax + by = c$. Slope = $\frac{-a}{b} = \frac{-5}{2}$

37. $r = \frac{7.35}{2}$
A = $\pi\left(\frac{7.35}{2}\right)^2 \div 2$

38. Half of this triangle is a 30-60-90 triangle.

$$h = \frac{(1.87\ x\ 10^5)(\sqrt{3})}{2}$$

47.

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

Look at the show key to get the full integer.

48. Area of one face $\frac{22.8^2}{2}$
6 faces = $6\left(\frac{22.8^2}{2}\right)$

49. $\sqrt{.75^2 + .875^2}$

50. $\frac{tan\ 32}{1} = \frac{x}{.0052}$

59. 15 ways to win
8 ways to lose. 23 total ways.
Probability of winning $\frac{15}{23}$

60. $\frac{180(48-2)}{48}$ OR

$180 - \frac{360}{48}$ where $\frac{360}{48}$ is the measure of an exterior angle

61. Inner diagonal = 17.81
Edge = $\frac{17.81}{\sqrt{3}}$ Volume = e^3

$$\left(\frac{17.81}{\sqrt{3}}\right)^3$$

62. $V = 611 = \frac{1}{2}(13)(8)x$

$$x = \frac{611(2)}{13(8)}$$

71.

	Rate	Time	Dist
To	65	$\frac{x}{65}$	x
From	80	$\frac{x}{80}$	x

Average speed is $\frac{total\ distance}{total\ time}$

$$\frac{2x}{\frac{x}{65} + \frac{x}{80}} = \frac{2x}{\frac{80x + 65x}{65(80)}} =$$

$$\frac{2x(65)(80)}{145x} = \frac{2(65)(80)}{145}$$

This is known as the harmonic mean.

72. $\frac{d_1}{(s_1)^2} = \frac{d_2}{(s_2)^2}$; $\frac{300}{55^2} = \frac{x}{80^2}$

$$x = \frac{300(80^2)}{55^2}$$

73. One side = $\frac{20502}{6}$
Area = 6 equilateral triangles =

$$6\left[\frac{\left(\frac{20502}{6}\right)^2\sqrt{3}}{4}\right]$$

74. $521^2 - \frac{521^2\sqrt{3}}{4}$