8

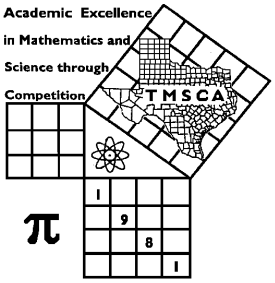
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #6 ©

DECEMBER 7, 2019

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 #6

1. 4850 – 5530 ---------- 1=_____

2. –4.1 + 4.4 + 3.29 ---------- 2=_____

3. 821 – 613 – 734 ---------- 3=_____

4. 33 – 13 – 18 – 16 ---------- 4=_____

5. 2100 + 2200 + 631 + 2090 ---------- 5=_____

6. 64.8 + 221 – 64.5 – 135 – 92.7 ---------- 6=_____

7. π – 5.95 + 3.21 – 1.81 – 0.745 ---------- 7=_____

8. (1.42 + 1.26 – 2.55) – (1.48 + 2.32) ---------- 8=_____

9. 57.2 x 276 x 195 ---------- 9=_____

10. 2070 x 87.5 x 823 x 222 ---------- 10=_____

11. An obtuse scalene triangle has two angles that measure 24° and 41°. Calculate the measure of the third angle. ---------- 11=_____$^{\circ}$

12. The range of a set of numbers is 1227. The smallest number in the set is 312. Calculate the largest number in the set. --------- 12=_____INT.

13. The arc of a circle is 225°. Convert this to radians. ---------- 13=_____rad.

14. $(246)[281 \times 325 \times 390]$ ---------- 14=_____

15. $(170)[78 \times 292/205]$ ---------- 15=_____

16. $(147 + 84)[144 - 186 - 236]$ ---------- 16=_____

17. $\{-185/152\}\left[\frac{114}{235 + 247}\right]$ ---------- 17=_____

18. $\left[\frac{(1850/278) - (648/2210)}{8.45 \times 10^{-4}/(0.00177)}\right]$ ---------- 18=_____

19. $\left[\frac{270/145}{82/33}\right]\{911 + 338 - 750\}$ ---------- 19=_____

20. $\frac{(\pi)(48/33)(34/24)}{235}$ ---------- 20=_____

21. $(0.0226)[354/462 \times 324/317] - 0.00628$ ---------- 21=_____

22. $\frac{(\pi)(274/315)(520/66)}{(486/481)}$ ---------- 22=_____

23. $\frac{(946 \times 253)/1060}{(947 \times 52.8) + 35000}$ ---------- 23=_____

24. Sammy purchased a car with $2000 down and payments of $161.37 per month for 5 years. Calculate the total amount he paid for his car. ---------- 24=$_____

25. This past year Trina spent $90.00 per month on gas. During the year, the average price of gas was $2.669 per gallon. Her car gets an average of 25 miles per gallon. According to these averages, calculate the number of miles she traveled this past year. ---------- 25=_____mi.

26. Calculate the measure of an interior angle of a regular septagon. 26=_____°

27. $(0.149)[[34.8/(14.4)][71.1/(29.2)]]$ ---------- 27=_____

28. $\dfrac{(7.97\text{x}10^{10}) + (1.59\text{x}10^{11})}{(-0.0011)(0.00229) - 2.10\text{x}10^{-6}}$ ---------- 28=_____

29. $[2640 - (2280 + 2930)] + [(-0.974)(1810 - 1230)]$ ---- 29=_____

30. $(9.92)\left[(2.96\text{x}10^{11}) - (7.11\text{x}10^{10})\right]$ ---------- 30=_____

31. $\dfrac{1}{0.714} + \dfrac{1}{(56.8 - 55.9)}$ ---------- 31=_____

32. $(0.434)\left[\dfrac{132}{(2.53\text{x}10^{10})}\right]$ ---------- 32=_____

33. $\dfrac{1}{486} - \dfrac{1}{2370} + \dfrac{1}{2130}$ ---------- 33=_____

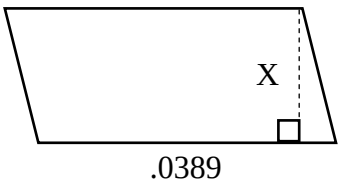
34. $\dfrac{1}{195} - \dfrac{1}{(205 + 158)}$ ---------- 34=_____

35. The volume of a cube is 387 cubic inches. Calculate the surface area of the cube. ---------- 35=_____$in.^2$

36. A circle has a diameter of 254.3 cm. Calculate the length of a leg of an isosceles right triangle with the same area. ---------- 36=_____cm

PARALLELOGRAM

Area = 0.000591

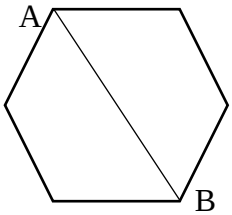


X = ?

37=_____

REGULAR HEXAGON

AB = 32.81



Perimeter = ?

38=_____

39. $\left[\frac{1.22}{31.1}\right](429 + 1080)^4$ ---------- 39=_____

40. $(112 + 224 + 113)^2(182 + 69.7)^2$ ---------- 40=_____

41. $(0.413 + 0.306)^2(45.7 + 48.8)^2$ ---------- 41=_____

42. $(1/\pi)\sqrt[3]{\frac{0.322 + 0.81}{0.988 - 0.617}}$ ---------- 42=_____

43. $\sqrt{(377/208) + 1.58 - 1.55}$ ---------- 43=_____

44. $\sqrt{3510 - 1220 + 2990} - \sqrt{768}$ ---------- 44=_____

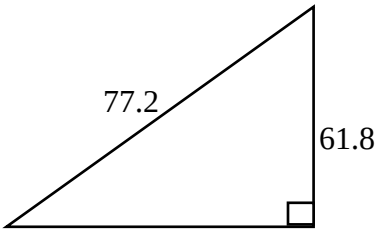
45. $(12300)\sqrt[3]{2130 + 3520 - 721}$ ---------- 45=_____

46. $\sqrt[3]{1.81 - 1730/1330} + 1/\sqrt{6.2 + 7.45}$ ---------- 46=_____

47. Calculate the value of 525 Base 7 in Base 10. ---------- 47=_____INT.

48. The distance an object falls varies directly as the square of the time it falls. An object falls 13.78 feet in 3 seconds. Calculate how far the object will fall in 20 seconds. ---------- 48=_____ft.

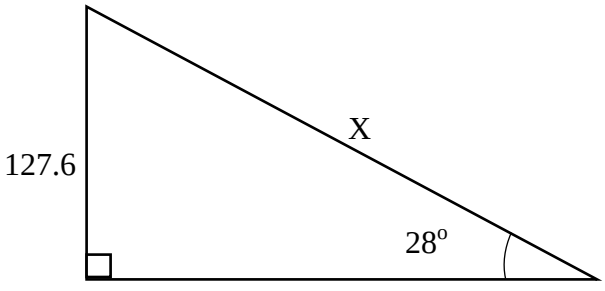
RIGHT TRIANGLE



Perimeter = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{42 - 39.3 + \sqrt{1890/282}}{-18.8 + 20.9}\right]^4$ ---------- 51=_____

52. $\frac{\sqrt{8.38 + \pi + 8.99}}{(1.43 - 2.67 + 2.15)^2}$ ---------- 52=_____

53. $\left[\frac{\sqrt{\sqrt{16200 - 6490}}}{-(1870 - 3590)}\right]^3 [1.63 \times 10^5 + 1.53 \times 10^5]$ ---------- 53=_____

54. $\sqrt{\frac{1/(326 - 142)}{(171)(114 + 25.7)^5}}$ ---------- 54=_____

55. $(6.72)(7.47 \times 10^7)^{1/3} - [(865)(6220)]^{1/2}$ ---------- 55=_____

56. $(134)^2 \sqrt{(1.08)/(199)} - (845 + 1070)$ ---------- 56=_____

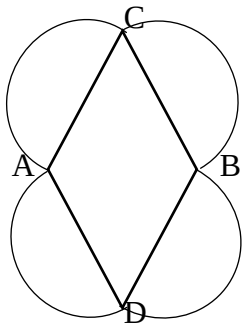
57. $\sqrt{\frac{1/(11.7 - 8.25)}{(101)(5.44 + 10.3)^{-4}}}$ ---------- 57=_____

58. $\sqrt{\frac{(504)(429)}{(29.1) + (3.01)}} + 1/(3.01)^{-4}$ ---------- 58=_____

59. The selling price of an automobile is $22,391.72. The final price including sales tax is $23,809.86. Calculate the percent sales tax. 59=_____%

60. A plane flies 1250 miles in 3 hours with the wind. On the return flight against the same wind it took 5 hours and 15 minutes. calculate the rate of the wind in miles per hour. ---------- 60=_____mph

SEMICIRCLES AND RHOMBUS

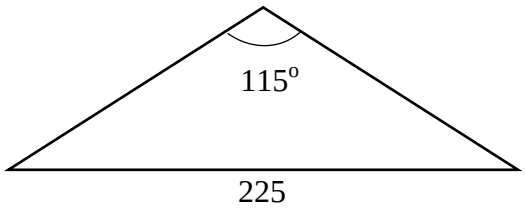


AB = 5.8
CD = 9.7

Total area = ?

61=_____

ISOSCELES TRIANGLE



Area = ?

62=_____

63. $\frac{27!/3!}{25! + 23!}$ ---------- 63=_____

64. $(4.88\text{x}10^5 - 2.69\text{x}10^5)^{10}(3.58\text{x}10^7)$ ---------- 64=_____

65. (deg) $(17.9 - 7.45)\tan(23.7°)$ ---------- 65=_____

66. (rad) $\tan\left[\frac{(1.13)(\pi)}{(0.907)(10.5)}\right]$ ---------- 66=_____

67. (deg) $(36700 - 43000)\cos(31.1°) + 615$ ---------- 67=_____

68. (rad) $(235)\sin(835)$ ---------- 68=_____

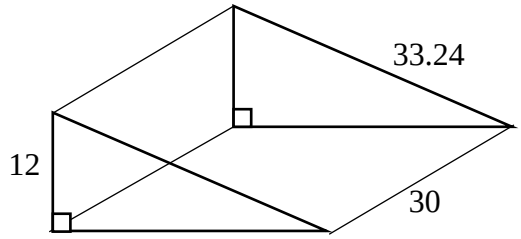
69. (deg) $\frac{\sin(5.54°)}{\tan(5.54°)}[58.5]$ ---------- 69=_____

70. $(555 - 137)^{0.778 - 0.12}$ ---------- 70=_____

71. A cylindrical tank is 30 feet long and has a diameter of 10 feet. Calculate the number of gallons this tank will hold if filled completely. ---------- 71=_____gal.

72. Calculate the slope of the line perpendicular to the line given by $-5y = -2x + 7$ ---------- 72=_____

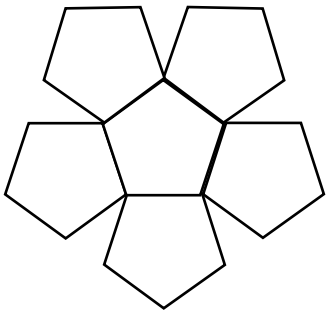
RIGHT TRIANGULAR PRISM



Volume = ?

73=_____

CONGRUENT REGULAR PENTAGONS



Area = 11259

Perimeter = ?

74=_____

75. $\frac{\text{Log}(471 + 191)}{215 - 792}$ ---------- 75=_____

76. $\frac{(1.51)^{0.718}(3.22)^{0.331}}{(1.63 - 1.62)^{-10}}$ ---------- 76=_____

77. $(8960)10^{(0.512)(3.6)}$ ---------- 77=_____

78. $\text{Ln}\left[\frac{90.1 + 486 + 570}{66.6 - 4.48 - 20.5}\right]$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 574$ ---------- 79=_____

80. $1 + \frac{(0.89)^4}{2} - \frac{(0.89)^6}{6} + \frac{(0.89)^8}{24} - \frac{(0.89)^{10}}{120}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #6 Answer Key

Page 1

1 = -680
= -6.80×10^{2}

2 = 3.59
= 3.59×10^{0}

3 = -526
= -5.26×10^{2}

4 = -14.0
= -1.40×10^{1}

5 = 7020
= 7.02×10^{3}

6 = -6.40
= -6.40×10^{0}

7 = -2.15
= -2.15×10^{0}

8 = -3.67
= -3.67×10^{0}

9 = 3.08×10^{6}

10 = 3.31×10^{10}

11 = 115
= 1.15×10^{2}

12 = 1539 INT.

13 = 3.93
= 3.93×10^{0}

Page 2

14 = 8.76×10^{9}

15 = 18900
= 1.89×10^{4}

16 = -64200
= -6.42×10^{4}

17 = -0.288
= -2.88×10^{-1}

18 = 13.3
= 1.33×10^{1}

19 = 374
= 3.74×10^{2}

20 = 0.0275
= 2.75×10^{-2}

21 = 0.0114
= 1.14×10^{-2}

22 = 21.3
= 2.13×10^{1}

23 = 0.00266
= 2.66×10^{-3}

24 = $11682.20

25 = 10100
= 1.01×10^{4}

26 = 129
= 1.29×10^{2}

Page 3

27 = 0.877
= 8.77×10^{-1}

28 = -5.17×10^{16}

29 = -3130
= -3.13×10^{3}

30 = 2.23×10^{12}

31 = 2.51
= 2.51×10^{0}

32 = 2.26×10^{-9}

33 = 0.00211
= 2.11×10^{-3}

34 = 0.00237
= 2.37×10^{-3}

35 = 319
= 3.19×10^{2}

36 = 319
= 3.19×10^{2}

37 = 0.0152
= 1.52×10^{-2}

38 = 98.4
= 9.84×10^{1}

Page 4

39 = 2.03×10^{11}

40 = 1.28×10^{10}

41 = 4620
= 4.62×10^{3}

42 = 0.462
= 4.62×10^{-1}

43 = 1.36
= 1.36×10^{0}

44 = 45.0
= 4.50×10^{1}

45 = 209000
= 2.09×10^{5}

46 = 1.07
= 1.07×10^{0}

47 = 264 INT.

48 = 612
= 6.12×10^{2}

49 = 185
= 1.85×10^{2}

50 = 272
= 2.72×10^{2}

2019-2020 TMSCA Middle School Calculator Test #6 Answer Key

Page 5

51 = 40.2
$= 4.02 \times 10^{1}$

52 = 5.47
$= 5.47 \times 10^{0}$

53 = 0.0607
$= 6.07 \times 10^{-2}$

54 = 2.44×10^{-8}

55 = 511
$= 5.11 \times 10^{2}$

56 = -592
$= -5.92 \times 10^{2}$

57 = 13.3
$= 1.33 \times 10^{1}$

58 = 164
$= 1.64 \times 10^{2}$

59 = 6.33
$= 6.33 \times 10^{0}$

60 = 89.3
$= 8.93 \times 10^{1}$

Page 6

61 = 78.3
$= 7.83 \times 10^{1}$

62 = 8060
$= 8.06 \times 10^{3}$

63 = 117
$= 1.17 \times 10^{2}$

64 = 9.08×10^{60}

65 = 4.59
$= 4.59 \times 10^{0}$

66 = 0.391
$= 3.91 \times 10^{-1}$

67 = -4780
$= -4.78 \times 10^{3}$

68 = -145
$= -1.45 \times 10^{2}$

69 = 58.2
$= 5.82 \times 10^{1}$

70 = 53.1
$= 5.31 \times 10^{1}$

71 = 17600
$= 1.76 \times 10^{4}$

72 = -2.50
$= -2.50 \times 10^{0}$

Page 7

73 = 5580
$= 5.58 \times 10^{3}$

74 = 661
$= 6.61 \times 10^{2}$

75 = -0.00489
$= -4.89 \times 10^{-3}$

76 = 1.98×10^{-20}

77 = 624000
$= 6.24 \times 10^{5}$

78 = 3.32
$= 3.32 \times 10^{0}$

79 = 82700
$= 8.27 \times 10^{4}$

80 = 1.24
$= 1.24 \times 10^{0}$

TMSCA 19-20 MS CA Test #6 Solutions to Word and Geometry Problems

11. 180 – 24 – 41

12. $x - 312 = 1227$

$x = 1227 + 312$

13. $225 \cdot \frac{\pi}{180}$ OR some calculators have a key which will convert for you.

24. 2000 + 161.37(12)(5)
Be sure to look at the exact cents.

25. gallons used = $\frac{90}{2.669}$

$$12\left[25\left(\frac{90}{2.669}\right)\right]$$

26. exterior angle = $\frac{360}{7}$

Interior angle = $180 - \frac{360}{7}$

OR $\frac{180\,(7-2)}{7}$

35. V = $e^3 = 387;\ e = \sqrt[3]{387}$

$SA = 6e^2 = 6\left(\sqrt[3]{387}\right)^2$

36. Area of circle =

$\pi r^2 = \pi\left(\frac{254.3}{2}\right)^2$

Area of triangle = $\frac{x^2}{2} =$

$\pi\left(\frac{254.3}{2}\right)^2$

$$x = \sqrt{2\pi\left(\frac{254.3}{2}\right)^2}$$

37. $\frac{.000591}{.0389}$

38. Diagonal of a hexagon = 2 sides. Perimeter = 32.81(3)

47. 5(7^2) + 2(7) + 5(1)

48. $\frac{d_1}{(t_1)^2} = \frac{d_2}{(t_2)^2}$

$$\frac{13.78}{9} = \frac{x}{20^2}$$

$$x = \frac{13.78(400)}{9}$$

49.

$\sqrt{77.2^2 - 61.8^2} + 77.2 + 61.8$

50. $\frac{sin\ 28}{1} = \frac{127.6}{x} =$

$$x = \frac{127.6}{\sin 28}$$

59. This is the same as asking for percent increase.

$\frac{23809.86-22391.72}{22391.72}$ x 100

HP RPN calculator has a key for % chg.

60.

	rate	time	dist
With wind	p+w	3	1250
Against wind	p -w	5.25	1250

$$\left\{\begin{matrix} 3(p+w) = 1250 \\ 5.25(p-w) = 1250 \end{matrix}\right\}$$

$$\left\{\begin{matrix} p + w = \frac{1250}{3} \\ -p + w = \frac{1250}{-5.25} \end{matrix}\right\}$$

$$2w = \frac{1250}{3} + \frac{1250}{-5.25}$$

Divide by 2 to get w.

61. A = area of rhombus plus 2 circles

Diameter = $\sqrt{\left(\frac{5.8}{2}\right)^2 + \left(\frac{9.7}{2}\right)^2}$

Radius = diameter/2

Area of rhombus = $\frac{5.8(9.7)}{2}$

Total area =

$$\frac{5.8(9.7)}{2} + \pi\left(\frac{\sqrt{\left(\frac{5.8}{2}\right)^2 + \left(\frac{9.7}{2}\right)^2}}{2}\right)^2 (2)$$

62. Drop an altitude from top down to side of 225. This makes two right triangles with angle of 115/2 = 57.7 and a leg of 225/2 = 112.5

$$\frac{\tan 57.7}{1} = \frac{112.5}{x}$$

$$x = 112.5 \div \tan 57.5$$

Area of triangle =

$$(112.5 \div \tan 57.5)(112.5)$$

71. Change feet to inches. $V = \pi r^2 h$. There are 231 cubic inches in 1 gallon.

$$\frac{\pi(5\ x\ 12)^2(30\ x\ 12)}{231}$$

72. $-5y = -2x + 7$

$$y = \frac{2}{5}x - \frac{7}{5}$$

The slope of the line perpendicular to this line is $\frac{-5}{2}$.

73.

$$V = \left[\frac{\left(\sqrt{33.24^2 - 12^2}\right)(12)}{2}\right] 30$$

		74. Area of one pentagon = $\frac{11259}{6}$ Area of a pentagon = $\frac{11259}{6} = \frac{perimeter^2}{\left(\tan\left\{\frac{180}{5}\right\}\right)(4x5)}$ Perimeter of one pentagon = $\sqrt{\left(\frac{11259}{6}\right)\left(\tan\frac{180}{5}\right)(20)}$ This is for 5 sides of a pentagon. The perimeter of the figure consists of 20 sides so final perimeter = $4\left[\sqrt{\left(\frac{11259}{6}\right)\left(\tan\frac{180}{5}\right)(20)}\right]$