8

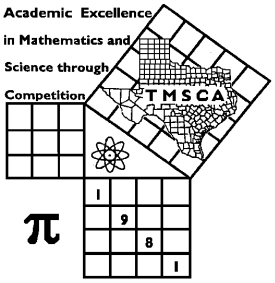
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



TMSCA MIDDLE SCHOOL

CALCULATOR

TEST #9 ©

JANUARY 27, 2018

GENERAL DIRECTIONS

I. About this test:
- A. You will be given 30 minutes to take this test.
- B. There are 80 problems on this test.

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.

2017-2018 TMSCA Middle School Calculator Test 9

1. 667 + 1430 ---------- 1=_____

2. 22 + 11 – 48 ---------- 2=_____

3. 1470 – 1730 + 539 ---------- 3=_____

4. 21 + 17 – π – 23 ---------- 4=_____

5. –1050 + 1060 + 2310 + 4250 ---------- 5=_____

6. –187 + 127 – 103 – 181 + 50.1 ---------- 6=_____

7. (5.23 + 2.21 – 5.49) – (2.54 + 3.73) ---------- 7=_____

8. (–1.66 – 3.73) + (1.35 – 1.18 – 1.49) ---------- 8=_____

9. 312 x 510 x 78.6 ---------- 9=_____

10. 14.6 x 6090 x 4370 x 896 ---------- 10=_____

11. The charge on my electric bill was $277.32 for 2,241 kilowatt hours. Calculate the charge per kilowatt hour. ---------- 11=$_____

12. The vertices of an isosceles triangle have the coordinates (0,0); (4,10); and (8,0). Calculate the area in square units. ---------- 12=_____units^2

13. Convert 7pi/6 radians to degrees. ---------- 13=_____^{o}

14. $(53/115)[68 - 126]$ ---------- 14=_____

15. $88/[122 \times 92 \times 45]$ ---------- 15=_____

16. $\{-590/535\}\left[\frac{103}{464 + 374}\right]$ ---------- 16=_____

17. $\left[\frac{396}{221}\right][(125/127) + 0.399]$ ---------- 17=_____

18. $\left[\frac{(3540/4790) - (3250/2640)}{203/56.1}\right]$ ---------- 18=_____

19. $\frac{[0.0284/(0.0132)]/0.0102}{(0.0188 \times 0.029)(0.0126)}$ ---------- 19=_____

20. $\frac{(\pi)(7/10)(8/7)}{103}$ ---------- 20=_____

21. $(0.119)[297/261 \times 286/177] - 0.0378$ ---------- 21=_____

22. $\frac{[-(647 + 901)(2380 - 642)]}{(12.7/(4020))}$ ---------- 22=_____

23. $\frac{(317 \times 1510)/170}{(1180 \times 27.7) + 10100}$ ---------- 23=_____

24. Sandy is taking 4 classes. Her midterm scores were 98, 87, 92, and 90. Calculate the range of her scores. ---------- 24=_____

25. In a 30-60-90 triangle, the hypotenuse measures 159.22 inches. Calculate the measure of the next longest side. ---------- 25=_____in.

26. The measure of one angle is 22 more than ½ its complement. Calculate the measure of the smaller angle. ---------- 26=_____°

27. $\dfrac{(2.62\text{x}10^{13}) + (2.90\text{x}10^{13})}{(-3.38\text{x}10^{-4})(0.00134) - 1.48\text{x}10^{-7}}$ ---------- 27=_____

28. $(\pi)[(29.3/93.5)(0.121 + 0.42)]$ ---------- 28=_____

29. $(2.75\text{x}10^{-4})[(0.143/0.0563)(141/240)]$ ---------- 29=_____

30. $\dfrac{1}{0.0103} + \dfrac{1}{(0.0098 - 0.00351)}$ ---------- 30=_____

31. $[0.365]\left[\dfrac{1/1540}{1/946}\right]$ ---------- 31=_____

32. $\dfrac{(78.9 + 26.7)}{(2.40\text{x}10^{12})}$ ---------- 32=_____

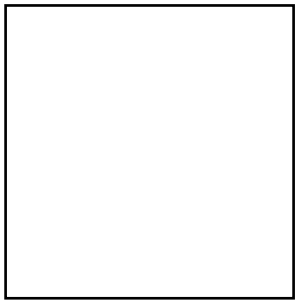
33. $\left[\dfrac{1/428}{1/206}\right] + [0.402]$ ---------- 33=_____

34. $1/(0.0524 - 0.0767) - 1/(-0.0166)$ ---------- 34=_____

35. Calculate the 12th power of the reciprocal of the additive inverse of π. ---------- 35=_____

36. The standard cruising speed of a commercial aircraft is about 520 miles per hour. Convert this speed to feet per second. ------ 36=_____ft/sec

SQUARE

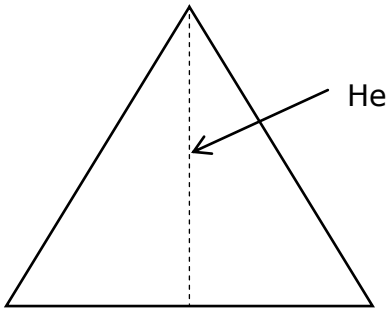


Perimeter = 1221

Area =?

37=_____

EQUILATERAL TRIANGLE



Height = 9119

Side = ?

38=_____

39. $(96.1 + 106 + 20.8)^2(3040 + 5950)^2$ ---------- 39=_____

40. $(1.57 + 1.89)^2(50.7 + 162)^2$ ---------- 40=_____

41. $\left[\frac{8.55}{27.9}\right](5340 + 1100)^2$ ---------- 41=_____

42. $(1/(0.0212))(5.50\text{x}10^5 - 2.79\text{x}10^5)^2$ ---------- 42=_____

43. $\sqrt{751} + \sqrt{460 + 1190} - (\pi)\sqrt{1970}$ ---------- 43=_____

44. $\sqrt{(1110/3300) + 0.136 - 0.0781}$ ---------- 44=_____

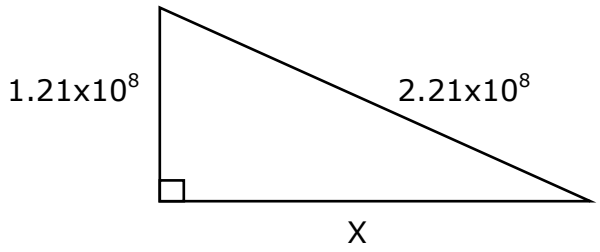
45. $\sqrt{0.608 - 54.4/125} + 1/\sqrt{20.3 + 27.5}$ ---------- 45=_____

46. $\left[\sqrt{(32.5/27.3)(2230)}\right]^4$ ---------- 46=_____

47. A bicycle tire has an outside diameter of 22 inches. Calculate the number of revolutions this tire makes on a 10 mile bike ride. ---- 47=_____revs.

48. Alex drove to Austin from home at an average speed of 50 mph. His return trip took 30 minutes longer because of traffic and he only averaged 45 mph. Calculate how far Austin is from Alex's home. ---------- 48=_____mi.

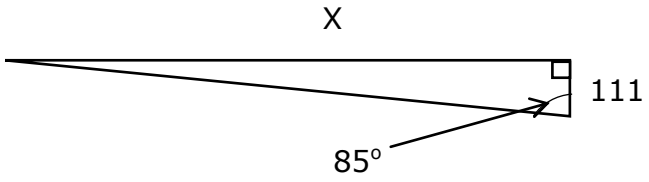
RIGHT TRIANGLE



X= ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{627 + 402 + \sqrt{4.96x10^5 + 3.11x10^5}}{24.5/24.1}\right]^2$ ---------- 51=_____

52. $\sqrt{\frac{0.00805}{(79800)(2.2)}} + \frac{(12.9 - 13)}{(126 + 138)}$ ---------- 52=_____

53. $\frac{(0.423 + 0.398 - 0.191)^3}{\sqrt{7720 + 11700 + 4530}}$ ---------- 53=_____

54. $\sqrt{\frac{(2.57x10^5)(16600)}{(1.36x10^5)(12400)}} - 0.518 + 1.33$ ---------- 54=_____

55. $380 + \sqrt{(713)(1300)} - (1440 + 1190)$ ---------- 55=_____

56. $0.173 + \sqrt{(141)/(1600)} - (0.216 + 0.542)^2$ ---------- 56=_____

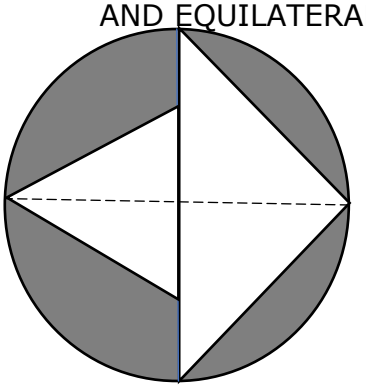
57. (deg) $\cos(84.7^\circ) + (22.2/21.3)$ ---------- 57=_____

58. $\sqrt{\frac{(2730)(113)}{(50.6) + (18.4)}} - 161$ ---------- 58=_____

59. Calculate the area of a regular octagon with a side length of 219 inches and an apothem of 264.35663 inches. ---------- 59=_____in.

60. Calculate the probability of rolling a sum greater than 9 on a standard pair of dice. ---------- 60=_____

CIRCLE, ISOSCELES TRIANGLE, AND EQUILATERAL TRIANGLE

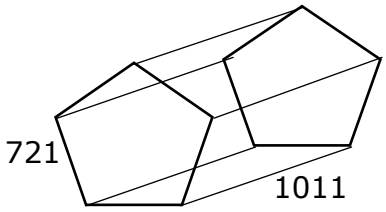


Radius = 7.115

Shaded Area = ?

61=_____

RIGHT REGULAR PENTAGONAL PRISM



Volume = ?

62=_____

63. $\frac{6! - 8!}{9!}$ ---------- 63=_____

64. $(64.8 - \pi)e^{0.114}$ ---------- 64=_____

65. (deg) $\frac{\cos(6.64°)}{463}$ ---------- 65=_____

66. (deg) $(17.4 - 12.5)\tan(12°) + 0.561$ ---------- 66=_____

67. (rad) $\frac{\tan(4.87)}{93/385}$ ---------- 67=_____

68. (deg) $\frac{\sin(31.9°)}{\tan(31.9°)}[377]$ ---------- 68=_____

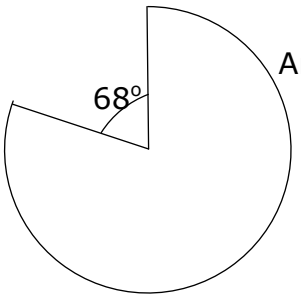
69. (rad) $(1.21)\tan(14.8)$ ---------- 69=_____

70. $\left[(680)\left(\frac{136}{(2.96)(\pi)}\right)\right]^{7/2}$ ---------- 70=_____

71. Taylor deposits $4,000 into an account that earns 4½ % compounded annually. Calculate the number of years it would take to have at least $10,000 in the account. ---------- 71=_____INT.

72. The sum of the digits in a three digit integer is 13. The tens digit is ½ the units digit and the units digit is 3 more than the sum of the other two digits. Calculate the 3 digit integer. ---------- 72=_____INT.

SECTOR OF A CIRCLE

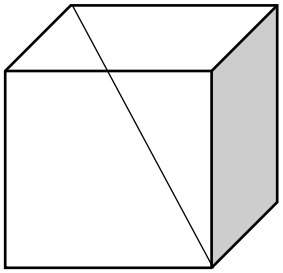


Area of Sector = 2.05×10^5

Radius = ?

73=_____

CUBE



Inner Diagonal = 1215

Volume = ?

74=_____

75. $\dfrac{\text{Log}(1.86 \times 10^5 + 5.85 \times 10^5)}{0.967}$ ---------- 75=_____

76. $\dfrac{64.6 + \sqrt{(64.1)(73.6)} + (4.98)(31.6)}{\sqrt{\sqrt{0.146 + 0.199}}}$ ---------- 76=_____

77. $\dfrac{5.32 - 13.3}{\text{Log}(17.4 + 12.5)}$ ---------- 77=_____

78. $(18.5)^{\pi}(0.161)^2(0.237 - 0.127)^5$ ---------- 78=_____

79. $4 + 6 + 8 + \ldots + 944$ ---------- 79=_____

80. $(0.219) - \dfrac{(0.219)^2}{2} + \dfrac{(0.219)^3}{3} - \dfrac{(0.219)^4}{4}$ ---------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 9 Answer Key

Page 1

1 = 2100
= 2.10×10^{3}

2 = -15.0
= -1.50×10^{1}

3 = 279
= 2.79×10^{2}

4 = 11.9
= 1.19×10^{1}

5 = 6570
= 6.57×10^{3}

6 = -294
= -2.94×10^{2}

7 = -4.32
= -4.32×10^{0}

8 = -6.71
= -6.71×10^{0}

9 = 1.25×10^{7}

10 = 3.48×10^{11}

11 = $0.12

12 = 40.0
= 4.00×10^{1}

13 = 210
= 2.10×10^{2}

Page 2

14 = -26.7
= -2.67×10^{1}

15 = 0.000174
= 1.74×10^{-4}

16 = -0.136
= -1.36×10^{-1}

17 = 2.48
= 2.48×10^{0}

18 = -0.136
= -1.36×10^{-1}

19 = 3.07×10^{7}

20 = 0.0244
= 2.44×10^{-2}

21 = 0.181
= 1.81×10^{-1}

22 = -8.52×10^{8}

23 = 0.0658
= 6.58×10^{-2}

24 = 11.0
= 1.10×10^{1}

25 = 138
= 1.38×10^{2}

26 = 44.7
= 4.47×10^{1}

Page 3

27 = -9.19×10^{19}

28 = 0.533
= 5.33×10^{-1}

29 = 0.000410
= 4.10×10^{-4}

30 = 256
= 2.56×10^{2}

31 = 0.224
= 2.24×10^{-1}

32 = 4.40×10^{-11}

33 = 0.883
= 8.83×10^{-1}

34 = 19.1
= 1.91×10^{1}

35 = 1.08×10^{-6}

36 = 763
= 7.63×10^{2}

37 = 93200
= 9.32×10^{4}

38 = 10500
= 1.05×10^{4}

Page 4

39 = 4.02×10^{12}

40 = 542000
= 5.42×10^{5}

41 = 1.27×10^{7}

42 = 3.46×10^{12}

43 = -71.4
= -7.14×10^{1}

44 = 0.628
= 6.28×10^{-1}

45 = 0.560
= 5.60×10^{-1}

46 = 7.05×10^{6}

47 = 9170
= 9.17×10^{3}

48 = 225
= 2.25×10^{2}

49 = 1.85×10^{8}

50 = 1270
= 1.27×10^{3}

2017- 2018 TMSCA Middle School Calculator Test 9 Answer Key

Page 5

51 = 3.59×10^{6}

52 = -0.000165
= -1.65×10^{-4}

53 = 0.00162
= 1.62×10^{-3}

54 = 2.40
= 2.40×10^{0}

55 = -1290
= -1.29×10^{3}

56 = -0.105
= -1.05×10^{-1}

57 = 1.13
= 1.13×10^{0}

58 = -94.1
= -9.41×10^{1}

59 = 232000
= 2.32×10^{5}

60 = 0.167
= $1.67 \times 1o^{-1}$

Page 6

61 = 79.2
= 7.92×10^{1}

62 = 9.04×10^{8}

63 = -0.109
= -1.09×10^{-1}

64 = 69.1
= 6.91×10^{1}

65 = 0.00215
= 2.15×10^{-3}

66 = 1.60
= 1.60×10^{0}

67 = -26.0
= -2.60×10^{1}

68 = 320
= 3.20×10^{2}

69 = -1.55
= -1.55×10^{0}

70 = 9.81×10^{13}

71 = 21 INT.

72 = 148 INT.

Page 7

73 = 284
= 2.84×10^{2}

74 = 3.45×10^{8}

75 = 6.09
= 6.09×10^{0}

76 = 379
= 3.79×10^{2}

77 = -5.41
= -5.41×10^{0}

78 = 0.00400
= 4.00×10^{-3}

79 = 223000
= 2.23×10^{5}

80 = 0.198
= 1.98×10^{-1}

MSCA 17-18 MS CA Test #9 Solutions to Word and Geometry Problems

11. $\frac{277.32}{2241}$ = $.12 Don't put the third digit.

12. Base = 8, Ht. = 10

A = $\frac{8(10)}{2}$

13. π radians = 180 degrees $\frac{7}{6}(180)$. The HP calculator has a key that will convert this.

24. 98 – 87 = 11.0

25. Short leg = $\frac{hypotenuse}{2}$

Long leg is $\sqrt{3}\ times\ short\ leg$

$$\left(\frac{159.22}{2}\right)\sqrt{3}$$

26. x = angle; 90-x = complement

$$x = 22 += 22 + \frac{1}{2}(90 - x)$$

x = 44.7 degrees

35. $\left(\frac{1}{-\pi}\right)^{12}$

36. $\left(\frac{\mathbf{520\ mi}}{\mathbf{1\ hr}}\right)\left(\frac{\mathbf{5280 ft}}{\mathbf{1\ mi}}\right)\left(\frac{\mathbf{1\ hr}}{\mathbf{3600\ s}}\right)$

37. $\left(\frac{1221}{4}\right)^2$

38. Half of an equilateral triangle is a 30-60-90 triangle. Half of a side is the short leg of the 30-60-90 triangle = $\frac{9119}{\sqrt{3}}$

Double this value.

47. $Revolutions = \frac{distance}{circumference}$

Change 10 miles to inches.

$$Rev = \frac{10\ x\ 5280\ x\ 12}{22\pi}$$

48.

	Rate	Time	Dist
To	50	x	50x
From	45	x + ½	45(x+ ½)

$$50x = 45\left(x + \frac{1}{2}\right)$$

$$x = \frac{22.5}{5} = time.$$

Multiply by 50 to get distance.

49.

$$\sqrt{(2.21\ x\ 10^8)^2 - (1.21\ x\ 10^8)^2}$$

50. $\frac{tan\,85}{1} = \frac{x}{111}$

$$x = [111]tan(85)$$

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

$$A = \frac{1}{2}(264.35663)(8\ x\ 219)$$

60. 3 ways to get a 10; 2 ways to roll 11; 1 way to roll a 12

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

61. Area of circle = $\pi(7.115)^2$

Area of Eq. triangle = $\frac{7.115^2\sqrt{3}}{3}$

Area of Isosceles Triangle:

= $\frac{(7.115)(2)(7.115)}{2}$

Subtract the triangle areas from the circle area.

62. Area of a regular polygon:

$$\frac{perimeter^2}{\tan\left(\frac{180}{n}\right)(4n)}$$

$$\frac{[721(5)]^2}{\tan\left(\frac{180}{5}\right)(20)}$$

The volume is the above answer times 1011.

71. $4000(1.045)^x \geq 10000$

$$(1.045)^x \geq \frac{10000}{4000}$$

$\log(1.045)^x \geq \log\frac{10}{4}$

$$xlog(1.045) \geq log\frac{10}{4}$$

$x = \frac{\log\left(\frac{10}{4}\right)}{\log(1.045)}$ = 20.8 so as INT the answer is 21.

72. $\begin{Bmatrix} x + y + z = 13 \\ y = \frac{1}{2}z \\ z = 3 + x + y \end{Bmatrix}$

From Eq. 2, $z = 2y$

From Eq. 3, $x + y - 2y = -3$

$$\begin{Bmatrix} x + 3y = 13 \\ x - y = -3 \end{Bmatrix}$$

Solving; y = 4, z = 8, x = 1

73. **Fraction of the circle = $\frac{360-68}{360}$**

$$\left(\frac{\mathbf{360 - 68}}{\mathbf{360}}\right)\boldsymbol{\pi r^2} = \mathbf{2.05\ x\ 10^5}$$

$$r = \sqrt{\frac{2.05\ x\ 10^5}{\left(\frac{360 - 68}{360}\right)\pi}}$$

74. Edge = $\frac{1215}{\sqrt{3}}$

Volume = edge^3