

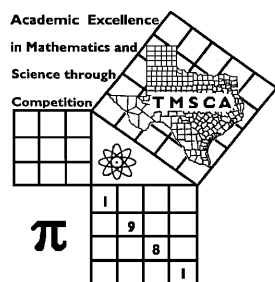
1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

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 # 10 ©

FEBRUARY 2, 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*}, 1.23x10¹, 1.23x10⁰¹, .0190, 1.90x10⁻²
 Incorrect: 12.30, 123.0, 1.23(10)², 1.23·10², 1.230x10², 1.23*10², 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.

2018-2019 TMSCA Middle School Calculator Test 10

1. $-7790 - 6040$ ----- 1= _____

2. $1.1 + 1.6 + 0.5$ ----- 2= _____

3. $-1500 - 468 - 2160$ ----- 3= _____

4. $38 - 32 - \pi - 8$ ----- 4= _____

5. $4960 - 865 + 1840 - 6090$ ----- 5= _____

6. $160 - 229 - 206 + 159 + 72.7$ ----- 6= _____

7. $-1.85 + 0.957 - 1.74 + 1.79 + 1.76$ ----- 7= _____

8. $3.47 + 0.787 + 1.56 + \pi + 0.732$ ----- 8= _____

9. $32.5 \times 177 \times 247$ ----- 9= _____

10. $52.6 \times 80.8 \times 180 \times 52.4$ ----- 10= _____

11. Calculate the arithmetic mean of the boiling point of water in °C, the freezing point of water in °F, the number of cubic inches in a gallon, and the number of yards in a mile. ----- 11= _____

12. There is a popular make of die cast cars that are made in 1:64 scale. A toy bus made in this scale is 5 inches long. Calculate the actual length of this bus in real life in feet. ----- 12= _____ ft.

13. The length of a rectangle is 1 foot more than twice its width. The perimeter of the rectangle is 428 cm. Calculate the length of the rectangle in cm. ----- 13= _____ cm

14. $(125)[97 \times 42 \times 31]$ -----14= _____
15. $(332/68)[113 - 188]$ -----15= _____
16. $\{(-168)(175 - 157)(113)\} - 1.49 \times 10^5$ -----16= _____
17. $\left[\frac{196}{104}\right] [(153/26) - 1.51]$ -----17= _____
18. $\left[\frac{(1690/2710) - (3890/3490)}{586/(268)}\right]$ -----18= _____
19. $\left[\frac{(0.00672 + 0.00197)}{96/99}\right] \left[\frac{0.0335}{3.82 \times 10^{-4}}\right]$ -----19= _____
20. $\frac{0.00339 + 0.0116 + 0.00177}{(1.23)(0.00555)(6.17 \times 10^{-6})}$ -----20= _____
21. $\frac{(\pi)(4/8)(6/2)}{37}$ -----21= _____
22. $\frac{(1530 \times 1190)/307}{(338 \times 10.9) + 1970}$ -----22= _____
23. $\frac{[-(2460 + 1780)(970 - 5600)]}{(14.6/(21900))}$ -----23= _____
24. Calculate the area of a circle with a circumference of 5.19×10^{10} cm. 24= _____ cm^2
25. Calculate the number of square inches in 5 square yards. -----25= _____ in^2
26. Maria took a TMSCA calculator test. She completed problems 1 thru 78 when time ran out. She missed 2 "number crunchers" and 2 "stated and geometry" problems. Calculate her score. -----26= _____ INT.

27. $(1.42)[(0.239/0.397)(80 + 35.9)]$ -----27= _____

28. $\frac{(8.78 \times 10^{11}) + (1.15 \times 10^{12})}{(-0.0445)(0.009) - 3.61 \times 10^{-4}}$ -----28= _____

29. $[2250 - (2540 + 1600)] + [(0.561)(536 - 3400)]$ -----29= _____

30. $(23.3)[(1.32 \times 10^8) - (1.59 \times 10^8)]$ -----30= _____

31. $\frac{1}{-4.63} + \frac{1}{(\pi)(19.7 - 21.4)}$ -----31= _____

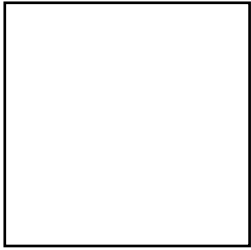
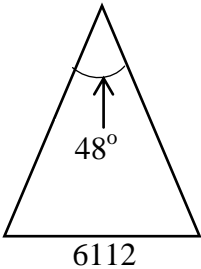
32. $(0.469) \left[\frac{6.62 \times 10^{-4}}{(2.62 \times 10^6)} \right]$ -----32= _____

33. $\left[\frac{1/1080}{1/711} \right] [3.10 \times 10^6]$ -----33= _____

34. $\left[\frac{1/283}{1/298} \right] + [0.912]$ -----34= _____

35. If Set A has 11 elements, calculate the number of proper subsets of Set A. -----35= _____ INT.

36. If $S(x) = 4x^2 + 7x - 5$ and $M(x) = 12x^2 - 4x + 2$, calculate $S(M(-4))$. -----36= _____

SQUARE	ISOSCELES TRIANGLE
	
<p style="text-align: right;">Area = 3.59×10^5</p> <p style="text-align: right;">Diagonal = ?</p>	<p style="text-align: right;">Area = ?</p>
<p>37= _____</p>	<p>38= _____</p>

39. $\sqrt[3]{\frac{4670 + 2850}{41.3 - 39.1}}$ -----39= _____

40. $\frac{(41600 + 20400)^3}{(0.4 - 0.524)^2}$ -----40= _____

41. $\left[\frac{20600 + (1/(2.86 \times 10^{-5}))}{(32200/36300) - 0.408} \right]^2$ -----41= _____

42. $\sqrt{8490 - 5700 + 5970} - \sqrt{3520}$ -----42= _____

43. $(736)\sqrt{204 + 271 + 143}$ -----43= _____

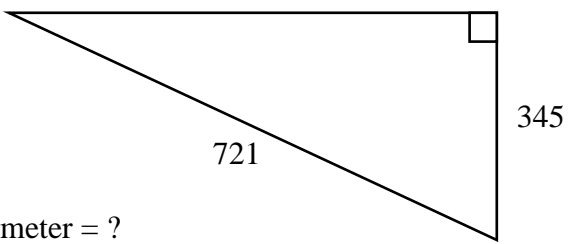
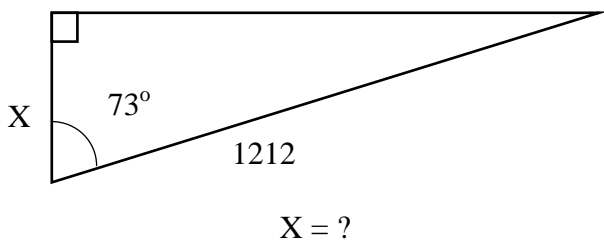
44. $\sqrt{752} + \sqrt{336 + 1090} - (\pi)\sqrt{860}$ -----44= _____

45. $(3230)\sqrt[3]{895 + 4050 - 1260}$ -----45= _____

46. $\left[\sqrt[3]{(368/359)(60.6)} \right]^5$ -----46= _____

47. Angle A and Angle B form a linear pair. Angle A measures $7x + 4$ and Angle B measures $4x + 9$. Calculate the measure of the larger angle in degree. -----47= _____°

48. Calculate the number of cubic feet in a 5.7 liter engine. -----48= _____ ft³

<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">Perimeter = ?</p> <p>49= _____</p>	<p style="text-align: center;">RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p> <p>50= _____</p>
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51. $\sqrt{\frac{9.01 \times 10^{-7}}{(3.88)(0.0458)}} + \frac{(0.012 - 0.0355)}{(2.25 + 4.54)}$ -----51=_____

52. $\left[\frac{1370 - 417 + \sqrt{2.98 \times 10^9 / 4460}}{-5.76 + 11.1} \right]^4$ -----52=_____

53. $\frac{\sqrt{1.52 + \pi + 0.506}}{(0.289 - 0.282 + 0.123)^2}$ -----53=_____

54. $\sqrt{\frac{(7520)(5540)}{(9580)(43500)}} - 0.0732 + 0.166$ -----54=_____

55. $\sqrt{\frac{1/(675 - 453)}{(34.8)(57.2 + 17.1)^2}}$ -----55=_____

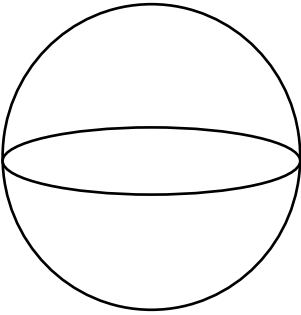
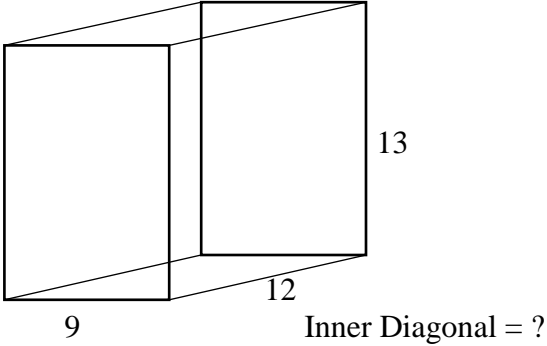
56. $20100 + \sqrt{(38800)(9220)} - (22600 + 23300)$ -----56=_____

57. $\sqrt{\frac{(2650)(256)}{(19.1) + (40.3)}} + 1/(0.0967)^2$ -----57=_____

58. $(\text{deg}) \sin(3500^\circ) + (74.6/50)$ -----58=_____

59. 25 ml of a 32% acid solution is evaporated down to 10 ml. Assuming only water is evaporated from the original solution, calculate the acid percentage of the remaining 10 ml. -----59=_____%

60. Calculate the fifteenth pentagonal number. -----60=_____ INT.

<p>SPHERE</p>  <p>Surface Area = 5715</p> <p>Area of Great Circle = ?</p> <p>61=_____</p>	<p>RECTANGULAR PRISM</p>  <p>Inner Diagonal = ?</p> <p>62=_____</p>
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63. $\frac{19!/9!}{20! + 18!}$ -----63=_____

64. $(1.94 \times 10^9 - 7.33 \times 10^9)^6 (3.66 \times 10^9)$ -----64=_____

65. (deg) $(13.2 + 7.55) \cos(113^\circ)$ -----65=_____

66. (rad) $\cos\left[\frac{(1.52)(\pi)}{(1.4)(1.11)}\right]$ -----66=_____

67. (deg) $(5.95 - 2.55) \sin(3.05^\circ) + 0.126$ -----67=_____

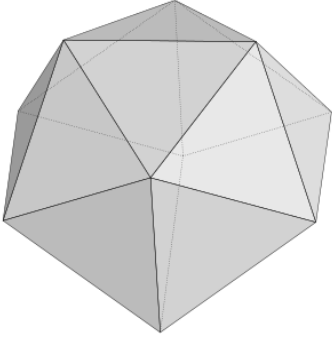
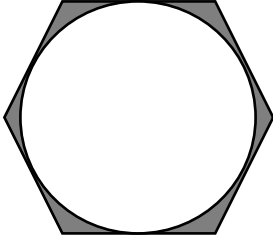
68. (rad) $(0.882) \cos(57.5)$ -----68=_____

69. (deg) $\frac{\tan(22.5^\circ)}{282 + 214}$ -----69=_____

70. $(3310 - 2640)^{0.235} - 0.495$ -----70=_____

71. Tickets to the State Fair of Texas are priced at \$18 for adults and \$14 for a child. One weekend a total of \$78,072 was brought in at the ticket booth. There were 964 more child tickets sold than adult tickets. Calculate the number of adult tickets sold. -----71=_____ INT.

72. A bag contains marbles, 6 green, 8 red, 12 blue, and 5 yellow. A marble is chosen at random and not replaced. Calculate the probability of drawing a blue marble and then a yellow. -----72=_____

<p style="text-align: center;">REGULAR ICOSAHEDRON</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: right;"> <p>Edge = 717</p> <p>Surface Area = ?</p> </div> </div> <p style="margin-top: 20px;">73= _____</p>	<p style="text-align: center;">REGULAR HEXAGON AND CIRCLE</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: right;"> <p>Radius of Circle = 22.8</p> <p>Shaded Area = ?</p> </div> </div> <p style="margin-top: 20px;">74= _____</p>
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75. $\frac{\text{Log}(47.1 + 42.1)}{10.2 - 13.5}$ -----75= _____
76. $\frac{(5.47)^{0.941}(2.03)^{0.262}}{(14.2 - 4.91)^{-9}}$ -----76= _____
77. $\frac{35.2 - 19.7}{\text{Log}(15.4 + 10.2)}$ -----77= _____
78. $\text{Ln}\left[\frac{113 + 93 + 39.9}{121 - 35.1 - 46.4}\right]$ -----78= _____
79. $1 + 2 + 3 + \dots + 451$ -----79= _____
80. $1 + (0.32) + \frac{(0.32)^2}{2} + \frac{(0.32)^3}{6} + \frac{(0.32)^4}{24}$ -----80= _____

2018-2019 TMSCA Middle School Calculator Test 10 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -13800 = -1.38×10^4	14 = 1.58×10^7	27 = 99.1 = 9.91×10^1	39 = 15.1 = 1.51×10^1
2 = 3.20 = 3.20×10^0	15 = -366 = -3.66×10^2	28 = -2.66×10^{15}	40 = 1.55×10^{16}
3 = -4130 = -4.13×10^3	16 = -491000 = -4.91×10^5	29 = -3500 = -3.50×10^3	41 = 1.35×10^{10}
4 = -5.14 = -5.14×10^0	17 = 8.24 = 8.24×10^0	30 = -6.29×10^8	42 = 34.3 = 3.43×10^1
5 = -155 = -1.55×10^2	18 = -0.225 = -2.25×10^{-1}	31 = -0.403 = -4.03×10^{-1}	43 = 18300 = 1.83×10^4
6 = -43.3 = -4.33×10^1	19 = 0.786 = 7.86×10^{-1}	32 = 1.19×10^{-10}	44 = -26.9 = -2.69×10^1
7 = 0.917 = 9.17×10^{-1}	20 = 398000 = 3.98×10^5	33 = 2.04×10^6	45 = 49900 = 4.99×10^4
8 = 9.69 = 9.69×10^0	21 = 0.127 = 1.27×10^{-1}	34 = 1.97 = 1.97×10^0	46 = 974 = 9.74×10^2
9 = 1.42×10^6	22 = 1.05 = 1.05×10^0		
10 = 4.01×10^7	23 = 2.94×10^{10}		
		35 = 2047 INT.	47 = 110 = 1.10×10^2
11 = 531 = 5.31×10^2	24 = 2.14×10^{20}	36 = 178000 = 1.78×10^5	48 = 0.201 = 2.01×10^{-1}
12 = 26.7 = 2.67×10^1	25 = 6480 = 6.48×10^3	37 = 847 = 8.47×10^2	49 = 1700 = 1.70×10^3
13 = 143 = 1.43×10^2	26 = 354 INT.	38 = 2.10×10^7	50 = 354 = 3.54×10^2

2018-2019 TMSCA Middle School Calculator Test 10 Answer Key

Page 5

$$51 = -0.00121 \\ = -1.21 \times 10^{-3}$$

$$52 = 1.21 \times 10^{10}$$

$$53 = 135 \\ = 1.35 \times 10^2$$

$$54 = 0.409 \\ = 4.09 \times 10^{-1}$$

$$55 = 0.000153 \\ = 1.53 \times 10^{-4}$$

$$56 = -6890 \\ = -6.89 \times 10^3$$

$$57 = 214 \\ = 2.14 \times 10^2$$

$$58 = 0.507 \\ = 5.07 \times 10^{-1}$$

$$59 = 80.0 \\ = 8.00 \times 10^1$$

$$60 = 330 \text{ INT.}$$

Page 6

$$61 = 1430 \\ = 1.43 \times 10^3$$

$$62 = 19.8 \\ = 1.98 \times 10^1$$

$$63 = 1.37 \times 10^{-7}$$

$$64 = 8.97 \times 10^{67}$$

$$65 = -8.11 \\ = -8.11 \times 10^0$$

$$66 = -0.998 \\ = -9.98 \times 10^{-1}$$

$$67 = 0.307 \\ = 3.07 \times 10^{-1}$$

$$68 = 0.512 \\ = 5.12 \times 10^{-1}$$

$$69 = 0.000835 \\ = 8.35 \times 10^{-4}$$

$$70 = 0.184 \\ = 1.84 \times 10^{-1}$$

$$71 = 2018 \text{ INT.}$$

$$72 = 0.0645 \\ = 6.45 \times 10^{-2}$$

Page 7

$$73 = 4450000 \\ = 4.45 \times 10^6$$

$$74 = 168 \\ = 1.68 \times 10^2$$

$$75 = -0.591 \\ = -5.91 \times 10^{-1}$$

$$76 = 3.07 \times 10^9$$

$$77 = 11.0 \\ = 1.10 \times 10^1$$

$$78 = 1.83 \\ = 1.83 \times 10^0$$

$$79 = 102000 \\ = 1.02 \times 10^5$$

$$80 = 1.38 \\ = 1.38 \times 10^0$$

TMSCA 18-19 MS CA Test #10 Solutions to Word and Geometry Problems

11. $\frac{100+32+231+1760}{4}$

12. $\frac{1}{64} = \frac{5}{x \text{ inches}}$;
 $x = 64(5)$

Divide by 12 to change to ft.

13. $w = \text{width}$
 $2w + 1 = \text{length}$
 $2w + 2(2w + 1) = 428$
 $w = 71$
 Length = $2(71) + 1$

24. $C = 2\pi r = 5.19 \times 10^{10}$
 $r = \frac{5.19 \times 10^{10}}{2\pi}$
 $\text{Area} = \pi r^2 = \pi \left(\frac{5.19 \times 10^{10}}{2\pi} \right)^2$

25. $5(36)(36)$

26. $78(5) - 4(9)$

35. $2^{11} - 1$

36. $m(-4) = 12(-4)^2 - 4(-4) + 2 = 210$
 $S(210) = 4(210)^2 + 7(210) - 5$

37. side = $\sqrt{3.59 \times 10^5}$
 Diagonal = $(\sqrt{3.59 \times 10^5})(\sqrt{2})$

38. An altitude from the vertex angle to the base, divides the 48° angle in half and the base in half. A right triangle is formed with an angle of 24° and a leg of 3056. To find the length of the altitude (h) use:

38. $\frac{\tan 24}{1} = \frac{3056}{h}$
 $h = \frac{3056}{\tan 24}$

Area = $\left(\frac{3056}{\tan 24} \right) (3056)$

47. $7x + 4 + 4x + 9 = 180$
 $x = \frac{167}{11}$
 Angle A = $7x + 4 = 7\left(\frac{167}{11}\right) + 4$

48. 1 gal ~ 3.79 liters
 $231 \text{ in}^3 = 1 \text{ gal.}$
 $1 \text{ ft}^3 = 1728 \text{ in}^3$
 $5.7 \text{ l} \cdot \frac{1 \text{ g}}{3.79 \text{ l}} \cdot \frac{231 \text{ in}^3}{1 \text{ g}} \cdot \frac{1 \text{ ft}^3}{1728 \text{ in}^3}$

49. long leg = $\sqrt{721^2 - 345^2}$
 Add all three sides for perimeter.

50. $\frac{\cos 73}{1} = \frac{x}{1212}$
 $x = 1212 (\cos 73)$

59.

	ml	%acid	acid
orig	25	.32	8
water	14	0	0
final	10	x	10x

$10x = 8; x = \frac{8}{10} = 80\%$

60. $\frac{n(3n-1)}{2} = \frac{(15)(45-1)}{2}$

61. Surface area = $4\pi r^2$
 Great circle area = πr^2
 $\frac{5715}{4}$

62. $\sqrt{9^2 + 12^2 + 13^2}$

71. A = # of adult tickets
 A+964 = # of child tickets
 $18A + 14(A+964) = 78072$
 Solve for A.

72. $\frac{12}{31} \cdot \frac{5}{30}$

73. An icosahedron's surface consists of 20 equilateral triangles.

$20 \left(\frac{717^2 \sqrt{3}}{4} \right)$

74. A hexagon consists of 6 equilateral triangles.
 Hexagon area = $6 \left(\frac{h^2 \sqrt{3}}{3} \right) =$

$6 \left(\frac{22.8^2 \sqrt{3}}{3} \right)$

Circle = $\pi(22.8)^2$
 Shaded area = hexagon minus circle

$6 \left(\frac{22.8^2 \sqrt{3}}{3} \right) - \pi(22.8)^2$