

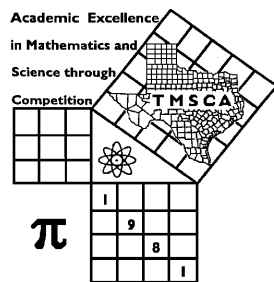
1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

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 # 11 ©

FEBRUARY 11, 2023

GENERAL DIRECTIONS

I. About this test:

A. You will be given 30 minutes to take this test. There are 80 problems on this test.

II. **Calculators limited to the types specified by UIL. Calculators are no longer required to be cleared.**

III. 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.

IV. 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).

V. 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.

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1. $1050 - 1690$ ----- 1= _____

2. $32 + 40 + 9$ ----- 2= _____

3. $3020 - 1900 - 1450$ ----- 3= _____

4. $22 - 87 + 57 - 80$ ----- 4= _____

5. $3050 - 6850 + 1770 - 3210$ ----- 5= _____

6. $205 + 335 - 216 - 298 + 236$ ----- 6= _____

7. $-4.39 + 4.85 - 1.47 + 4.16 + 4.3$ ----- 7= _____

8. $-4.75 + 4.66 + 3.51 + 3.22 + 2.71$ ----- 8= _____

9. $137 \times 159 \times 116$ ----- 9= _____

10. $6940 \times 217 \times 6530 \times 484$ ----- 10= _____

11. Calculate the product of the first five prime numbers. ----- 11= _____ INT.

12. Six hundred is what fraction of one million? ----- 12= _____

13. The sum of two integers is 471. The difference of these two integers is 573. Calculate the product of these two integers. ----- 13= _____ INT.

14. $(335)[537 \times 312/568]$ ----- 14= _____

15. $55/[75 \times 119 \times 76]$ ----- 15= _____

16. $\left[\frac{810}{635}\right] [(685/386) + 0.449]$ ----- 16= _____

17. $\{-160/300\} \left[\frac{169}{108 + 244}\right]$ ----- 17= _____

18. $\left[\frac{(0.274 + 0.449)}{425/291}\right] \left[\frac{\pi}{17}\right]$ ----- 18= _____

19. $\frac{(279/289) + (112/236)}{(\pi - 0.376)}$ ----- 19= _____

20. $(0.05)[71/169 \times 233/159] - 0.00954$ ----- 20= _____

21. $\frac{(1.15)(1.56)}{4.08 \times 10^{-5}} (5540 - 6260)$ ----- 21= _____

22. $\frac{(\pi)(168/113)(96/196)}{(224/195)}$ ----- 22= _____

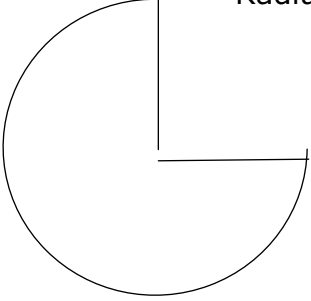
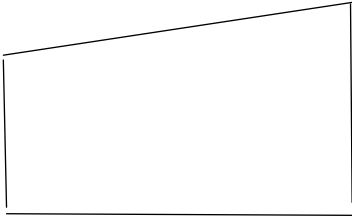
23. $\left[\frac{1190 + 2300}{3230 - 1770}\right] \left[\frac{4460}{2500}\right]$ ----- 23= _____

24. Emma buys 4 new pairs of shoes. The store has a buy one pair get another pair at 1/2 price, of equal or lesser value. The pairs she bought cost \$89.99, \$79.99, \$49.99 and \$25.99. If she pairs the 2 most expensive and the 2 least expensive for the BOGO, calculate the cost of the shoes, not including tax. ----- 24=\$ _____

25. Calculate the number of feet in one thousand centimeters. ----- 25= _____ ft.

26. The school offers AP English and AP Math classes. There are 15 students taking the AP Math class and 22 students taking the AP English class and 6 students taking both. Calculate the number of students taking AP classes. ----- 26= _____ INT.

27. $[432 - (380 + 814)] + [(-0.971)(2660 - 2000)]$ ----- 27= _____
28. $(2.96) \left[(4.63 \times 10^{-4} / 3.15 \times 10^{-4})(\pi + 2.22) \right]$ ----- 28= _____
29. $\frac{(4.76 \times 10^7) + (4.27 \times 10^7)}{(-9.69 \times 10^{-4})(0.00347) - 6.06 \times 10^{-7}}$ ----- 29= _____
30. $\frac{1}{11.8} + \frac{1}{(\pi)(192 - 179)}$ ----- 30= _____
31. $\frac{1}{-0.0135} + \frac{1}{(0.00535 - 0.00972)}$ ----- 31= _____
32. $(18.8) \left[(4.14 \times 10^8) - (6.55 \times 10^7) \right]$ ----- 32= _____
33. $\left[\frac{1/1070}{1/215} \right] [1.07 \times 10^6]$ ----- 33= _____
34. $1/(0.00253 - 0.00299) - 1/(-2.15 \times 10^{-4})$ ----- 34= _____
35. The number of EVs, electric vehicles, went from 4,200 to a whopping 422,507. Calculate the percent increase in EVs. ----- 35= _____ %
36. A circle and an isosceles right triangle have the same area. The equal legs of the triangle measure 17.28 in. Calculate the radius of the circle in inches. ----- 36= _____ in.

<p>37. THREE-QUARTER CIRCLE</p> <p style="text-align: right;">Radius = 719</p>  <p style="text-align: center;">Perimeter = ?</p> <p>37= _____</p>	<p>38. TRAPEZOID</p>  <p style="text-align: right;">Area = ?</p> <p>38= _____</p>
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39. $\left[\frac{203 + (1/(0.0056))}{(382/1310) - 0.239} \right]^2$ ----- 39= _____

40. $\left[\frac{92.7}{3.56} \right] (77.4 + 52.7)^2$ ----- 40= _____

41. $(0.297 + 0.266 + 0.0989)^2 (1.23 + 0.929)^2$ ----- 41= _____

42. $(1/(0.0117))(6110 - 3100)^3$ ----- 42= _____

43. $(18400)\sqrt{127 + 61.2 + 64.6}$ ----- 43= _____

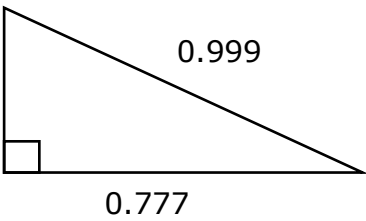
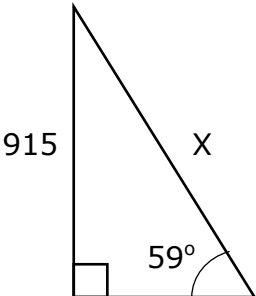
44. $\sqrt{2230} + \sqrt{571 + 2060} - (\pi)\sqrt{1760}$ ----- 44= _____

45. $\sqrt{0.683 - 265/663} + 1/\sqrt{7.64 + 2.03}$ ----- 45= _____

46. $\left[3\sqrt{(201/208)(124)} \right]^2$ ----- 46= _____

47. Calculate -5971^{6721} . ----- 47= _____

48. A father is 21 years older than his son. Five years ago, he was four times as old as his son. Calculate the age of the father today. ---- 48= _____ INT.

<p>49. RIGHT TRIANGLE</p>  <p style="text-align: center;">Perimeter = ?</p>	<p>50. RIGHT TRIANGLE</p>  <p style="text-align: center;">X = ?</p>
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51. $\left[\frac{\sqrt{\sqrt{447 - 172}}}{-(0.0703 - 0.0485)} \right]^2 [27.4 + 4.23]$ ----- 51= _____

52. $\sqrt{\frac{1.67 \times 10^{-4}}{(134)(3.33)} + \frac{(0.00497 - 0.00209)}{(1.57 + 1.4)}}$ ----- 52= _____

53. $\left[\frac{20200 + 15900 + \sqrt{2.52 \times 10^8 + 8.30 \times 10^8}}{288/367} \right]^3$ ----- 53= _____

54. $926 + \sqrt{(820)(621)} - (1240 + 218)$ ----- 54= _____

55. $\sqrt{\frac{(4.45 \times 10^5)(4.60 \times 10^5)}{(39000)(52000)}} - 2.42 + 4.43$ ----- 55= _____

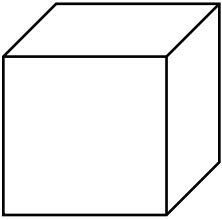
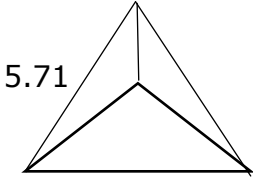
56. $\sqrt{\frac{1/(58.4 - 14.3)}{(313)(96.7 + 17.5)^2}}$ ----- 56= _____

57. $\sqrt{\frac{1/(36.9 - 26.3)}{(249)(2080 + 1250)^4}}$ ----- 57= _____

58. $(\text{deg}) \sin(609^\circ) + (702/1160)$ ----- 58= _____

59. Cindy makes a base salary of \$1500 per week plus 5% commission on her sales. If her weekly paycheck was for \$2150, calculate her sales for the week. ----- 59=\$ _____

60. Calculate the odds of rolling a single die and having it land on a 2. 60= _____

<p>61. CUBE</p> <p style="text-align: right;">Surface Area = 9215</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Inner Diagonal = ?</p> <p>61= _____</p>	<p>62. REGULAR TETRAHEDRON</p> <div style="text-align: center;">  </div> <p style="text-align: right;">Surface Area = ?</p> <p>62= _____</p>
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63. $\frac{27!}{25!} + 6!$ ----- 63= _____

64. (deg) $(14.5 - 16.3)\sin(4.4^\circ)$ ----- 64= _____

65. $(1.13 \times 10^8 - 6.55 \times 10^7)^{-6}(9980)$ ----- 65= _____

66. (deg) $[35]\cos(9.03^\circ - 3.33^\circ)$ ----- 66= _____

67. (deg) $\sin(0.142^\circ - 0.863^\circ) + 0.0115$ ----- 67= _____

68. (deg) $\frac{\sin(18.5^\circ)}{\tan(18.5^\circ)}[13.2]$ ----- 68= _____

69. (deg) $\frac{\tan(16^\circ)}{335 + 300}$ ----- 69= _____

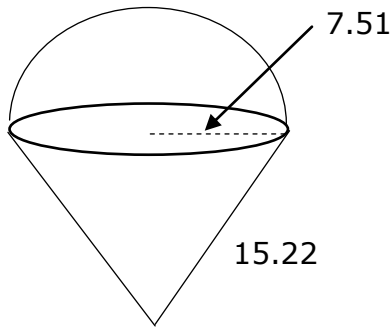
70. $(333 - 321)^{0.146} - 0.17$ ----- 70= _____

71. Calculate the density of a cube with a mass of 115 grams and each edge measuring 6 cm. ----- 71= _____ g/cm³

72. Calculate the length of the apothem of a regular octagon with a side length of 7.22 cm. ----- 72= _____ cm

73.

CONE AND HEMISPHERE

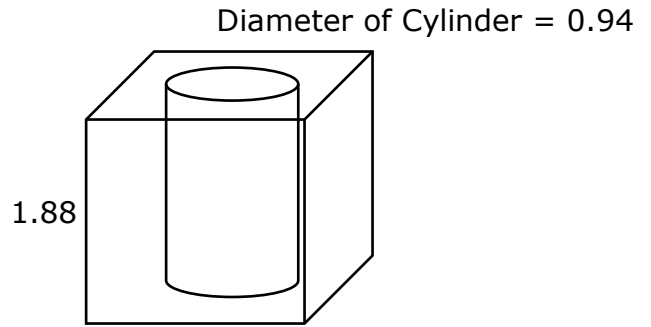


Surface Area = ?

73= _____

74.

CUBE WITH CYLINDER CUT OUT



Remaining volume of cube = ?

74= _____

75. $\frac{(11)^{0.292}(5.62)^{0.572}}{(11.3 - 11.2)^{-4}}$ ----- 75= _____

76. $\ln\left[\frac{82.5 + 40.2 + 84.3}{115 + 214 - 190}\right]$ ----- 76= _____

77. $(1710)10^{(0.815)(3.83)}$ ----- 77= _____

78. $(1.85)^\pi(1.6)^3(10.9 - 9.08)^5$ ----- 78= _____

79. $1 + 3 + 5 + \dots + 399$ ----- 79= _____

80. $\frac{1}{(0.55)} + \frac{1}{3(0.55)^3} + \frac{1}{5(0.55)^5} + \frac{1}{7(0.55)^7}$ ----- 80= _____

2022 – 2023 TMSCA Middle School Calculator Test 11 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -640 = -6.40×10^2	14 = 98800 = 9.88×10^4	27 = -1400 = -1.40×10^3	39 = 5.26×10^7
2 = 81.0 = 8.10×10^1	15 = 8.11×10^{-5}	28 = 23.3 = 2.33×10^1	40 = 441000 = 4.41×10^5
3 = -330 = -3.30×10^2	16 = 2.84 = 2.84×10^0	29 = -2.28×10^{13}	41 = 2.04 = 2.04×10^0
4 = -88.0 = -8.80×10^1	17 = -0.256 = -2.56×10^{-1}	30 = 0.109 = 1.09×10^{-1}	42 = 2.33×10^{12}
5 = -5240 = -5.24×10^3	18 = 0.0915 = 9.15×10^{-2}	31 = -303 = -3.03×10^2	43 = 293000 = 2.93×10^5
6 = 262 = 2.62×10^2	19 = 0.521 = 5.21×10^{-1}	32 = 6.55×10^9	44 = -33.3 = -3.33×10^1
7 = 7.45 = 7.45×10^0	20 = 0.0212 = 2.12×10^{-2}	33 = 215000 = 2.15×10^5	45 = 0.854 = 8.54×10^{-1}
8 = 9.35 = 9.35×10^0	21 = -3.17×10^7	34 = 2480 = 2.48×10^3	46 = 24.3 = 2.43×10^1
9 = 2.53×10^6	22 = 1.99 = 1.99×10^0		
10 = 4.76×10^{12}	23 = 4.26 = 4.26×10^0	35 = 9960 = 9.96×10^3	47 = -6.49×10^{25378}
11 = 2310 INT.	24 = \$192.97	36 = 6.89 = 6.89×10^0	48 = 33 INT.
12 = 0.000600 = 6.00×10^{-4}	25 = 32.8 = 3.28×10^1	37 = 4830 = 4.83×10^3	49 = 2.40 = 2.40×10^0
13 = -26600 = -2.66×10^4	26 = 31 INT.	38 = 212 = 2.12×10^2	50 = 1070 = 1.07×10^3

2022 – 2023 TMSCA Middle School Calculator Test 11 Answer Key

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$$\begin{aligned} 51 &= 1.10 \times 10^6 \\ 52 &= 0.00158 \\ &= 1.58 \times 10^{-3} \\ 53 &= 6.80 \times 10^{14} \\ 54 &= 182 \\ &= 1.82 \times 10^2 \\ 55 &= 12.1 \\ &= 1.21 \times 10^1 \\ 56 &= 7.45 \times 10^{-5} \\ 57 &= 1.76 \times 10^{-9} \\ 58 &= -0.328 \\ &= -3.28 \times 10^{-1} \\ 59 &= \$13,000.00 \\ 60 &= 0.200 \\ &= 2.00 \times 10^{-1} \end{aligned}$$

Page 6

$$\begin{aligned} 61 &= 67.9 \\ &= 6.79 \times 10^1 \\ 62 &= 56.5 \\ &= 5.65 \times 10^1 \\ 63 &= 1420 \\ &= 1.42 \times 10^3 \\ 64 &= -0.138 \\ &= -1.38 \times 10^{-1} \\ 65 &= 8.69 \times 10^{-43} \\ 66 &= 34.8 \\ &= 3.48 \times 10^1 \\ 67 &= -0.00108 \\ &= -1.08 \times 10^{-3} \\ 68 &= 12.5 \\ &= 1.25 \times 10^1 \\ 69 &= 0.000452 \\ &= 4.52 \times 10^{-4} \\ 70 &= 0.942 \\ &= 9.42 \times 10^{-1} \\ 71 &= 0.532 \\ &= 5.32 \times 10^{-1} \\ 72 &= 8.72 \\ &= 8.72 \times 10^0 \end{aligned}$$

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$$\begin{aligned} 73 &= 713 \\ &= 7.13 \times 10^2 \\ 74 &= 5.34 \\ &= 5.34 \times 10^0 \\ 75 &= 0.000541 \\ &= 5.41 \times 10^{-4} \\ 76 &= 0.398 \\ &= 3.98 \times 10^{-1} \\ 77 &= 2.26 \times 10^6 \\ 78 &= 565 \\ &= 5.65 \times 10^2 \\ 79 &= 40000 \\ &= 4.00 \times 10^4 \\ 80 &= 17.2 \\ &= 1.72 \times 10^1 \end{aligned}$$

11. $2(3)(5)(7)(11)$

12. $\frac{600}{1,000,000}$

13. $\begin{cases} x + y = 471 \\ x - y = 573 \end{cases}$
 $2x = 1044; x = 522$
 $y = 471 - 522 = -51$
 Product: $(-51)(522)$

24. $89.99 + \frac{79.99}{2} + 49.99 + \frac{25.99}{2}$

25. $1000cm = \frac{1000}{2.54}$ inches
 Divide by 12 to change to feet.
 $\frac{1000}{2.54} \div 12$

26. $n(A \cup B) =$
 $n(A) + n(B) - n(A \cap B)$
 $22 + 15 - 6$

35. If your calculator has a % change key, enter 4200, then 422507 followed by % chg.
 Otherwise, $\frac{422507-4200}{4200} \cdot 100$

36. Area of triangle: $\frac{17.28^2}{2}$
 Circle: $\pi r^2 = \frac{17.28^2}{2}$
 $2\pi r^2 = 17.28^2$
 $r = \sqrt{\frac{17.28^2}{2\pi}}$

37. Perimeter is $\frac{3}{4}$ of the circumference plus 2 radii.
 $\frac{3}{4}[2\pi(719)] + 2(719)$

38. $\frac{(11.12+7.55)22.7}{2}$

47. 6721 5971

(Look at the digits to the left of the decimal. This gives 25378 for the exponent. Write down 10^{25378} .) Then punch 25378

(This gives 6.49 E0 which is the first part of your answer. Notice the negative in the problem. The answer is -6.49×10^{25378}). This is done on the HP RPN calculator.

48.

	Now	5 yrs ago
Father	x	$x - 5$
Son	$x - 21$	$x - 26$

$x - 5 = 4(x - 26)$
 $x - 5 = 4x - 104$
 $99 = 3x; x = 33$

49.

Short Leg: $\sqrt{.999^2 - .777^2}$
 Perimeter: $\sqrt{.999^2 - .777^2} + .999 + .777$

50. $\sin 59 = \frac{915}{x}$
 $x = \frac{915}{\sin 59}$

59. $1500 + .05x = 2150$
 $x = \frac{2150 - 1500}{.05}$

60. There is one way to get 2 and 5 ways to not get a 2 when rolling one die. $\frac{1}{5}$

61. Surface Area = $2d^2$
 $2d^2 = 9215$
 $d = \sqrt{\frac{9215}{2}}$

62. Four equilateral triangles
 $4\left(\frac{5.71^2\sqrt{3}}{4}\right) = 5.71^2\sqrt{3}$

71. density = $\frac{\text{mass}}{\text{volume}}$
 $\frac{115}{6^3}$

Notice the answer blank indicates what to do when it says: g/cm³

72. The central angle of an octagon is $360/8 = 45^\circ$. Draw the apothem into the figure. This forms a right triangle with angle $45/2$ and base of $7.22/2 = 3.61$

$\tan 22.5 = \frac{3.61}{x}$
 $x = \frac{3.61}{\tan 22.5}$

73. $\pi rs + 2\pi r^2$
 $\pi(7.51)(15.22) + 2\pi(7.51)^2$

74. Volume of cube minus volume of cylinder
 $1.88^3 - \pi\left(\frac{.94}{2}\right)^2 (1.88)$

