8

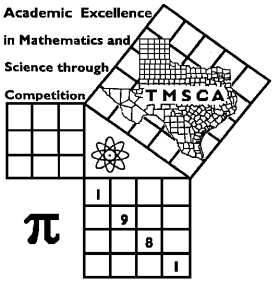
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 #1 ©

OCTOBER 21, 2017

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 #1

1. 363 + 666 ---------- 1=_____

2. 2.5 + 3.7 + 1.5 ---------- 2=_____

3. 244 – 66 – 184 ---------- 3=_____

4. 19 – 18 – π – 10 ---------- 4=_____

5. 159 – 153 + 152 – 502 ---------- 5=_____

6. 123 + 67.4 – 67 – 22.1 – 42.1 ---------- 6=_____

7. (1.34 + 0.823 – 1.5) – (0.86 + 1.4) ---------- 7=_____

8. 2.97 – 0.853 + 2.4 – 2.46 – 4.84 ---------- 8=_____

9. 70.8 x 73.7 x 401 ---------- 9=_____

10. 132 x 1040 x 90.8 x 32.2 ---------- 10=_____

11. Calculate the median of the first eleven prime numbers. --------- 11=_____INT.

12. Calculate the perimeter of a regular pentagon with sides that measure thirty-two hundredths inches. ---------- 12=_____in.

13. Three thousand, two hundred twelve is what percent of five million, one hundred two thousand, eight hundred forty-two. ---------- 13=_____%

14. $(-59/107)[242 - 111]$ ---------- 14=_____

15. $(35)[44 \times 66/65]$ ---------- 15=_____

16. $\left[\frac{80}{125}\right][(59/116) - 0.295]$ ---------- 16=_____

17. $\left[\frac{-109}{232}\right][(209/90) + 0.495]$ ---------- 17=_____

18. $\frac{(89/31) + (123/67)}{(1.62 - 0.534)}$ ---------- 18=_____

19. $\left[\frac{137/250}{143/234}\right]\{0.00154 + 0.00145 - 7.54 \times 10^{-4}\}$ ---------- 19=_____

20. $\frac{219}{(431 - 237)} - \frac{(352 - 382)}{230}$ ---------- 20=_____

21. $\frac{(\pi)(3/6)(9/11)}{64}$ ---------- 21=_____

22. $\left[\frac{2810 + 466}{1150 - 812}\right]\left[\frac{519}{2750}\right]$ ---------- 22=_____

23. $\frac{(2010 \times 4290)/1910}{(865 \times 4630) + 1.95 \times 10^{6}}$ ---------- 23=_____

24. Convert 871 liters to gallons. ---------- 24=_____gal.

25. Bill and his cowboys could vaccinate 32 head of cattle in one hour. Calculate the number of hours to vaccinate their 500 head herd. 25=_____hrs.

26. Calculate the circumference of a circular field with an area of twelve and six hundredths square centimeters. ---------- 26=_____cm

27. $(72.6)\left[(0.75/0.323)(1.79 + 0.964)\right]$ ---------- 27=_____

28. $\dfrac{(0.591 - 0.5)(0.311 + 0.272)}{(1.46\text{x}10^{11})}$ ---------- 28=_____

29. $\dfrac{(\pi + 1.19)(0.0508 + 0.0691)}{(1.62\text{x}10^{12})}$ ---------- 29=_____

30. $(16.3)\left[(4.80\text{x}10^{12}) - (3.35\text{x}10^{12})\right]$ ---------- 30=_____

31. $(0.00479)\left[\dfrac{0.00139}{(2.62\text{x}10^{7})}\right]$ ---------- 31=_____

32. $\dfrac{1}{597} + \dfrac{1}{(\pi)(3020 - 2650)}$ ---------- 32=_____

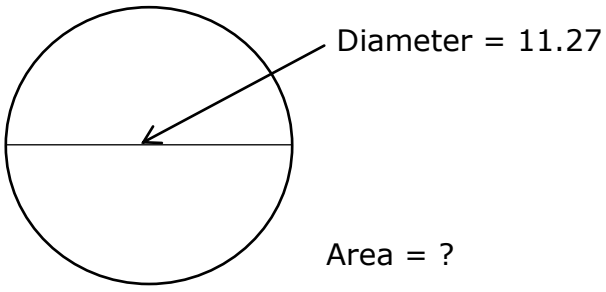
33. $\left[\dfrac{1/145}{1/188}\right] + [0.949]$ ---------- 33=_____

34. $\left[\dfrac{1/183}{1/192}\right][2.77\text{x}10^{6}]$ ---------- 34=_____

35. Rons' paycheck was $422.85. He spent $41.75 on gas, $56.00 on insurance and gave $25 to each of his two little brothers. Calculate how much of his paycheck he has left. ---------- 35=$_____

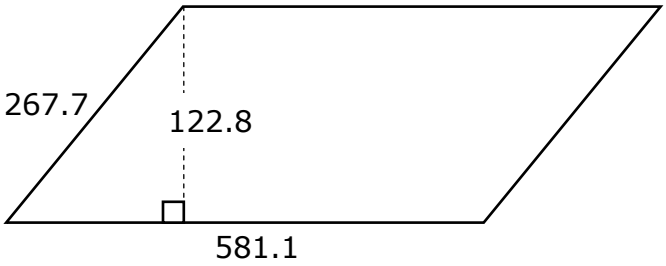
36. In 1960, gasoline was $0.31 per gallon. In July of 2017, the price was $2.19 per gallon. Calculate the percent increase. ----- 36=_____%

CIRCLE



37=_____

PARALLELOGRAM



38=_____

39. $\sqrt[3]{\frac{2.77 + 2.62}{637 - 433}}$ ---------- 39=_____

40. $\left[\frac{0.432}{623}\right](17.6 + 61.1)^2$ ---------- 40=_____

41. $(11.1 + 3.99)^2(0.231 + 0.178)^2$ ---------- 41=_____

42. $\sqrt{(6200/3910) + 1.23 - 0.41}$ ---------- 42=_____

43. $(1/\pi)\sqrt[4]{\frac{1.45 + 5.45}{0.0244 - 0.0102}}$ ---------- 43=_____

44. $\sqrt{20.7} + \sqrt{10.5 + 26.6} - (\pi)\sqrt{28.6}$ ---------- 44=_____

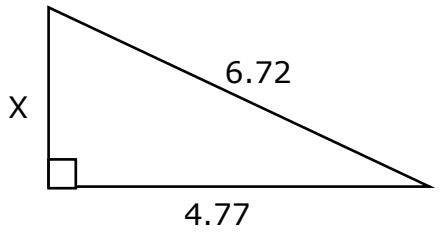
45. $\sqrt[3]{1.17 - 2010/1940} + 1/\sqrt{351 + 159}$ ---------- 45=_____

46. $\left[\sqrt{(1080/1130)(3990)}\right]^3$ ---------- 46=_____

47. Triangle A with base of 22 inches and a height of 37 inches is similar to another Triangle B with a base of 37 inches. Calculate the area of Triangle B in square inches. ---------- 47=_____$in.^2$

48. A circle and a square have the same perimeter. The radius of the circle is 52.1 feet. Calculate the length of a side of the square in feet. ---------- 48=_____ft.

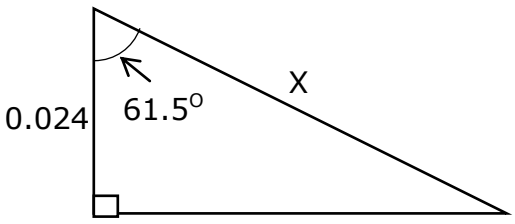
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\left[\frac{2700 - 609 + \sqrt{3.79\text{x}10^{7}/13.8}}{-1640 + 2100}\right]^{2}$ ---------- 51=_____

52. $\left[\frac{\sqrt{\sqrt{5.9 - 5.44}}}{-(8130 - 8720)}\right]^{3}[0.0785 + 0.0709]$ ---------- 52=_____

53. $\sqrt{\frac{5.89\text{x}10^{-12}}{(183)(0.0281)} + \frac{(0.0429 - 0.0625)}{(2640 + 9530)}}$ ---------- 53=_____

54. $(7.62)^{2}\sqrt{(3.29)/(1.66)} - (29.7 + 57.1)$ ---------- 54=_____

55. $18400 + \sqrt{(10600)(30200)} - (16100 + 22500)$ ---------- 55=_____

56. $(107)(3.45\text{x}10^{6})^{1/3} - [(3.24\text{x}10^{5})(2.34\text{x}10^{6})]^{1/3}$ ---------- 56=_____

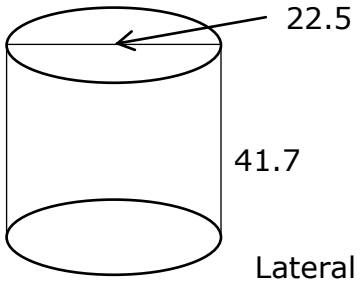
57. $\sqrt{\frac{1/(104 - 48.8)}{(24.6)(2790 + 2390)^{-5}}}$ ---------- 57=_____

58. (rad) sin(18.2) + (17.7/17.7) ---------- 58=_____

59. Two angles are complementary such that one angle is 7° more than twice the second angle. Calculate the measure of the smaller angle in degrees. ---------- 59=_____°

60. Calculate the final temperature when 86.7 gallons of water at 16.5° C. is mixed with 86.7 gallons of water at 52.7° C. ---------- 60=_____°C

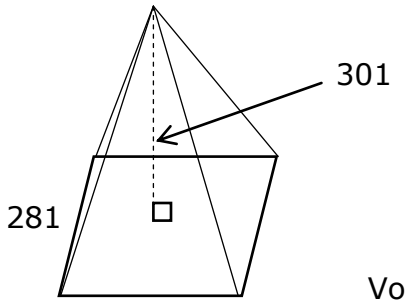
CYLINDER



Lateral Surface Area = ?

61=_____

SQUARE BASE PYRAMID



Volume = ?

62=_____

63. $\frac{17!}{13!} + 9!$ ---------- 63=_____

64. (deg) $\frac{\sin(36.4°)}{2900}$ ---------- 64=_____

65. (deg) $(143 - 236)\sin(338°)$ ---------- 65=_____

66. (rad) $\frac{\sin(179)}{630/455}$ ---------- 66=_____

67. (deg) $\tan(5.26° - 2.89°) + 0.0407$ ---------- 67=_____

68. (deg) $\frac{\sin(84.9°)}{\tan(84.9°)}[56]$ ---------- 68=_____

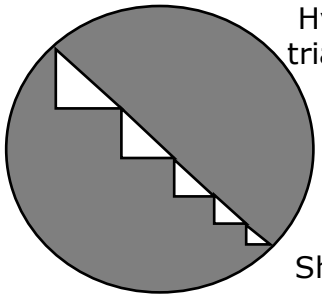
69. (deg) $\frac{\sin(130°)}{368 + 102}$ ---------- 69=_____

70. $(81.7 - 743)e^{\pi - 0.272}$ ---------- 70=_____

71. Calculate the odds of flipping a quarter and having it land on heads. ---------- 71=_____

72. Calculate how many possible ways of making groups of three students from a class of 10 students. ---------- 72=_____INT.

CIRCLE AND ISOSCELES RIGHT TRIANGLES

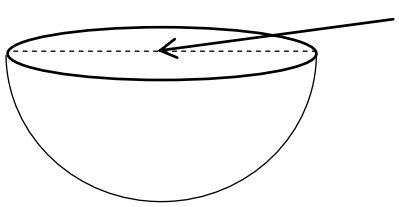


Hypotenuses of the right triangles are 5, 4, 3, 2, 1

Shaded Area = ?

73=_____

HEMISPERE



Volume = ?

74=_____

75. $\dfrac{(4.13)^{0.575}(5.55)^{0.112}}{(1.05 - 0.72)^{-10}}$ ---------- 75=_____

76. $\dfrac{\text{Log}(9300 + 10900)}{229 - 379}$ ---------- 76=_____

77. $\dfrac{15700 - 6260}{\text{Log}(1530 + 1800)}$ ---------- 77=_____

78. $(0.0862)^{\pi}(398)^{4}(19.9 - 9.44)^{4}$ ---------- 78=_____

79. $1 + 3 + 5 + \ldots + 467$ ---------- 79=_____

80. $\dfrac{1}{(0.109)} + \dfrac{1}{3(0.109)^{3}} + \dfrac{1}{5(0.109)^{5}} + \dfrac{1}{7(0.109)^{7}}$ ---------- 80=_____

2017-2018 TMSCA Middle School Calculator Test 1 Answer Key

Page 1

1 = 1030
= 1.03×10^{3}

2 = 7.70
= 7.70×10^{0}

3 = -6.00
= -6.00×10^{0}

4 = -12.1
= -1.21×10^{1}

5 = -344
= -3.44×10^{2}

6 = 59.2
= 5.92×10^{1}

7 = -1.60
= -1.60×10^{0}

8 = -2.78
= -2.78×10^{0}

9 = 2.09×10^{6}

10 = 4.01×10^{8}

11 = 13 INT.

12 = 1.60
= 1.60×10^{0}

13 = 0.0629
= 6.29×10^{-2}

Page 2

14 = -72.2
= -7.22×10^{1}

15 = 1560
= 1.56×10^{3}

16 = 0.137
= 1.37×10^{-1}

17 = -1.32
= -1.32×10^{0}

18 = 4.33
= 4.33×10^{0}

19 = 0.00201
= 2.01×10^{-3}

20 = 1.26
= 1.26×10^{0}

21 = 0.0201
= 2.01×10^{-2}

22 = 1.83
= 1.83×10^{0}

23 = 0.000758
= 7.58×10^{-4}

24 = 230
= 2.30×10^{2}

25 = 15.6
= 1.56×10^{1}

26 = 12.3
= 1.23×10^{1}

Page 3

27 = 464
= 4.64×10^{2}

28 = 3.63×10^{-13}

29 = 3.21×10^{-13}

30 = 2.36×10^{13}

31 = 2.54×10^{-13}

32 = 0.00254
= 2.54×10^{-3}

33 = 2.25
= 2.25×10^{0}

34 = 2.91×10^{6}

35 = $275.10

36 = 606
= 6.06×10^{2}

37 = 99.8
= 9.98×10^{1}

38 = 1700
= 1.70×10^{3}

Page 4

39 = 0.298
= 2.98×10^{-1}

40 = 4.29
= 4.29×10^{0}

41 = 38.1
= 3.81×10^{1}

42 = 1.55
= 1.55×10^{0}

43 = 1.49
= 1.49×10^{0}

44 = -6.16
= -6.16×10^{0}

45 = 0.556
= 5.56×10^{-1}

46 = 235000
= 2.35×10^{5}

47 = 1150
= 1.15×10^{3}

48 = 81.8
= 8.18×10^{1}

49 = 4.73
= 4.73×10^{0}

50 = 0.0503
= 5.03×10^{-2}

2017-2018 TMSCA Middle School Calculator Test 1 Answer Key

Page 5

51 = 66.4
= 6.64×10^{1}

52 = 4.06×10^{-10}

53 = -5.40×10^{-7}

54 = -5.06
= -5.06×10^{0}

55 = -2310
= -2.31×10^{3}

56 = 7050
= 7.05×10^{3}

57 = 5.24×10^{7}

58 = 0.395
= 3.95×10^{-1}

59 = 27.7
= 2.77×10^{1}

60 = 34.6
= 3.46×10^{1}

Page 6

61 = 2950
= 2.95×10^{3}

62 = 7920000
= 7.92×10^{6}

63 = 420000
= 4.20×10^{5}

64 = 0.000205
= 2.05×10^{-4}

65 = 34.8
= 3.48×10^{1}

66 = 0.0511
= 5.11×10^{-2}

67 = 0.0821
= 8.21×10^{-2}

68 = 4.98
= 4.98×10^{0}

69 = 0.00163
= 1.63×10^{-3}

70 = -11700
= -1.17×10^{4}

71 = 1.00
= 1.00×10^{0}

72 = 120 INT.

Page 7

73 = 163
= 1.63×10^{2}

74 = 0.182
= 1.82×10^{-1}

75 = 4.19×10^{-5}

76 = -0.0287
= -2.87×10^{-2}

77 = 2680
= 2.68×10^{3}

78 = 1.36×10^{11}

79 = 54800
= 5.48×10^{4}

80 = 795000
= 7.95×10^{5}

TMSCA 2017-2018 MS CA Test 1 Solutions to Word and Geometry Problems

11. The median of the first 11 prime numbers would be the 6th prime number: 2,3,5,7,11,13. INT tells you that you must write 13, not 13.0

12. .32(5)

13. $\frac{x}{100} = \frac{3212}{5{,}102{,}842}$

24. On the HP RPN calculator there is a key to convert liters to gallons. Without this calculator, a student would need to know that 1 gal is about 3.79 liters.

$$\frac{871}{x} = \frac{3.79\ liters}{1\ gal}$$

25.

$$\frac{32}{1} = \frac{500}{x}$$

26. $A = \pi r^2 = 12.06$

$$r = \sqrt{\frac{12.06}{\pi}}$$

C = $2\pi r = 2\pi\left(\sqrt{\frac{12.06}{\pi}}\right)$

35. \$422.85 – 41.75 – 56 – 25(2) Look at the full answer to get exact cents. You are allowed 1 cent error.

36. On HP RPN calculator Punch .31 enter; 2.19; %chg. This key is above the ÷ key. Without the HP RPN calculator: $\left(\frac{2.19-.31}{.31}\right)100$

37. $A = \pi r^2$ Diameter is 11.27 so $r = \frac{11.27}{2}$

$A = \pi\left(\frac{11.27}{2}\right)^2$

38. P = (581.1)(2) + 267.7(2) OR (581.1 + 267.7)2

47.

$\frac{37}{22} = \frac{h}{37}$ where h is the height of triangle B. $h = \frac{37^2}{22}$

Area of B = $\frac{1}{2}bh$

$$\frac{1}{2}(37)\left(\frac{37^2}{22}\right)$$

48. $C = 2\pi r;\ C = 2\pi(52.1)$ Side of square is $\frac{2\pi(52.1)}{4}$

49. $\sqrt{6.72^2 - 4.77^2} = x$

50.

$$\frac{cos\ 61.5}{1} = \frac{.024}{x}$$

$$x = \frac{.024}{\cos 61.5}$$

59. Let A = smaller angle Let B = larger angle = 2A + 7 Complementary angles add to 90 degrees.

2A + 7 + A = 90; 3A = 83; A = $\frac{83}{3}$

60. Since the gallons are the same, you can average the 2 temperatures. $\frac{16.5+52.7}{2}$

61. $LSA = 2\pi rh$; radius = $\frac{22.5}{2}$

$$LSA = 2\pi\left(\frac{22.5}{2}\right)(41.7)$$

62. $V = \frac{Bh}{3}$ where B is area of the base. $V = \frac{281^2(301)}{3}$

71.

$$Odds = \frac{\#\ of\ heads}{\#\ of\ "not\ heads"} = \frac{1}{1}$$

72. Order doesn't matter so this is a combination problem. $C = \frac{n!}{r!(n-r!)} = \frac{10!}{3!(10-3)!}$ OR on the HP RPN calculator you can punch 10 enter; 7 and the Combination key. On the 35s calculator, the key is the multiplication key.

73. Diameter = 1+2+3+4+5 = 15. Radius is 7.5. Area of each triangle is $\frac{hypotenuse^2}{4}$ Find area of circle minus the area of the 5 triangles.

$$7.5^2\pi - \frac{5^2}{4} - \frac{4^2}{4} - \frac{3^2}{4} - \frac{2^2}{4} - \frac{1^2}{4}$$

OR $7.5^2\pi - \left(\frac{25+16+9+4+1}{4}\right)$

74. $Volume\ of\ hemisphere = \frac{2}{3}\pi r^3$. Radius = $\frac{.8852}{2}$

$$\frac{2}{3}\pi\left(\frac{.8852}{2}\right)^3$$