8

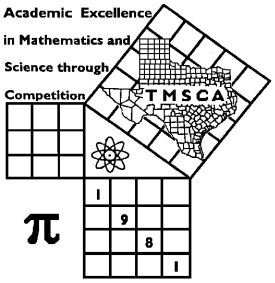
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

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 KICK-OFF TEST © 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 Kick-Off On-Line Meet

1. 1180 – 1160 ---------- 1=_____

2. 7 + 40 – 29 ---------- 2=_____

3. 71 – 157 + 79 ---------- 3=_____

4. 45 + 30 – 14 – 38 ---------- 4=_____

5. –372 + 564 – 255 – 508 ---------- 5=_____

6. 240 – 90.2 – 35.5 – 146 + 84.3 ---------- 6=_____

7. (1.53 + 2.62 – 0.913) – (5.52 + 4.84) ---------- 7=_____

8. (–0.596 – π) + (0.762 – 0.877 – 1.95) ---------- 8=_____

9. 369 x 532 x 74.8 ---------- 9=_____

10. 512 x 1880 x 140 x 57.6 ---------- 10=_____

11. Calculate the arithmetic mean of the first ten composite numbers. 11=_____

12. Calculate the area of a right isosceles triangle with a leg length of 172.8 meters. ---------- 12=_____m^2

13. Convert fourteen metric tons to kilograms. ---------- 13=_____kg

14. $(-96)[93 \times 65 \times 53]$ ---------- 14=_____

15. $(183)[105 \times 204/166]$ ---------- 15=_____

16. $\left[\frac{176}{242}\right][(83/52) + 0.937]$ ---------- 16=_____

17. $\{71/96\}\left[\frac{29}{70 + 106}\right]$ ---------- 17=_____

18. $\frac{(109/237) + (240/90)}{(\pi - 8.26)}$ ---------- 18=_____

19. $\frac{[0.00255/(0.0154)]/572}{(0.0494 \times 0.0565)(0.105)}$ ---------- 19=_____

20. $\frac{471 + 2270 + 916}{(454)(0.0507)(0.127)}$ ---------- 20=_____

21. $\frac{(\pi)(8/5)(5/9)}{53}$ ---------- 21=_____

22. $\left[\frac{2980 + 1190}{1000 - 3580}\right]\left[\frac{3280}{570}\right]$ ---------- 22=_____

23. $\frac{(\pi)(77/25)(98/107)}{(99/124)}$ ---------- 23=_____

24. Brianna completed all the problems on her calculator test through number 72. She missed only one-ninth of those problems. Calculate her score. ---------- 24=_____INT.

25. Calculate the selling price of a $12 item, if the store owner marks it up 42% before putting it on the shelf. ---------- 25=$_____

26. The ratio of larvae to butterflies is 14 to 25. If there are a total of 336 larvae, calculate the number of butterflies. ---------- 26=_____INT.

27. $(3.5)[[11.9/(3.53)][0.0641/(0.0135)]]$ ---------- 27=_____

28. $[339 - (1150 + 1040)] + [(7.35)(903 - 1130)]$ ---------- 28=_____

29. $\dfrac{(4.65\text{x}10^{12}) + (9.91\text{x}10^{12})}{(-3.75)(1.18) - 2.68}$ ---------- 29=_____

30. $\dfrac{1}{95.4} + \dfrac{1}{(\pi)(380 - 165)}$ ---------- 30=_____

31. $\dfrac{(0.00758 + 0.00872)}{(1.84\text{x}10^{11})}$ ---------- 31=_____

32. $(0.175)\left[\dfrac{0.0552}{(1.24\text{x}10^{7})}\right]$ ---------- 32=_____

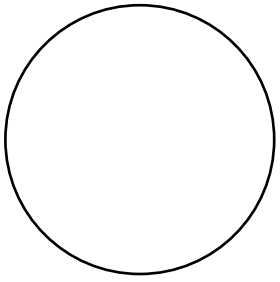
33. $\left[\dfrac{1/634}{1/640}\right] + [0.838]$ ---------- 33=_____

34. $1/(0.207 - 0.0626) - 1/(0.071)$ ---------- 34=_____

35. A right isosceles triangle and a circle have the same area. The radius of the circle is 7.125 cm. Calculate the measure of a leg of the triangle. ---------- 35=_____cm

36. Owen creates a sequence 1/1, 1/3, 1/9, 1/27… Calculate the value of the 21st term. ---------- 36=_____

CIRCLE



Diameter = 5.818

Area = ?

37=_____

RECTANGLE

52.1

Area = 666

Width = ?

38=_____

39. $\left[\frac{1190}{220}\right](134 + 636)^2$ ---------- 39=_____

40. $\left[\frac{388 + (1/(7.61\text{x}10^{-4}))}{(1190/1270) - 0.693}\right]^2$ ---------- 40=_____

41. $(2.77 + 1.47)^2(91.4 + 231)^2$ ---------- 41=_____

42. $(1/\pi)\sqrt[4]{\frac{0.0363 + 0.0132}{1.85 - 0.291}}$ ---------- 42=_____

43. $\sqrt{(1610/1210) + 0.652 - 0.219}$ ---------- 43=_____

44. $\sqrt{26.4} + \sqrt{23.6 + 28.6} - (\pi)\sqrt{16.6}$ ---------- 44=_____

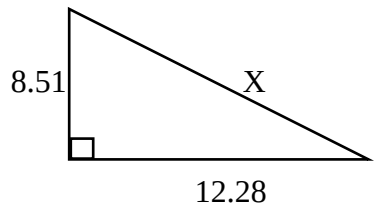
45. $(7030)\sqrt[3]{193 + 195 - 53}$ ---------- 45=_____

46. $\left[\sqrt{(770/1950)(607)}\right]^3$ ---------- 46=_____

47. Calculate the amount of time it would take to double $5000 at 5% simple interest. ---------- 47=_____yrs.

48. The interior angles of a rhombus are in the ratio of 4:9:4:9. Calculate the measure of one of the largest angles. ---------- 48=_____°

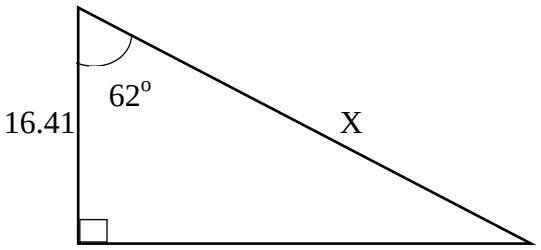
RIGHT TRIANGLE



X = ?

49=_____

RIGHT TRIANGLE



X = ?

50=_____

51. $\dfrac{\sqrt{1.14 + \pi + 0.83}}{(0.957 - 0.321 + 0.867)^2}$ ---------- 51=_____

52. $\left[\dfrac{13400 + 14400 + \sqrt{1.59x10^8 + 1.59x10^8}}{11500/21600}\right]^4$ ---------- 52=_____

53. $\left[\dfrac{\sqrt{\sqrt{2.73 - 2.37}}}{-(21.2 - 22)}\right]^2 [1380 + 2660]$ ---------- 53=_____

54. $\sqrt{\dfrac{(1.03x10^5)(1.05x10^5)}{(6780)(8430)}} - 12.8 + 1.64$ ---------- 54=_____

55. $(18)^2 \sqrt{(119)/(661)} - (38.8 + 16.3)$ ---------- 55=_____

56. $\sqrt{\dfrac{1/(10.5 - 1.92)}{(601)(52.1 + 31.5)^5}}$ ---------- 56=_____

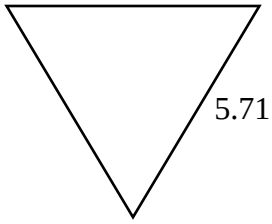
57. (rad) sin(185) + (233/58.2) ---------- 57=_____

58. (deg) cos(336°) + (1410/1050) ---------- 58=_____

59. The product of a number and negative eight, increased by twenty-two is eighteen. Calculate the value of the number. ----- 59=_____

60. Calculate the probability of drawing the ten of diamonds from a standard deck of cards. ---------- 60=_____

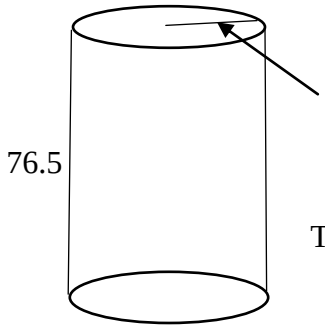
EQUILATERAL TRIANGLE



Area = ?

61=_____

CYLINDER



Total Surface Area = ?

62=_____

63. $\frac{25! - 27!}{26!}$ ---------- 63=_____

64. $(291 - \pi)e^{0.181}$ ---------- 64=_____

65. (deg) (9.32 – 31)tan(30.3°) ---------- 65=_____

66. (deg) (6470 – 1640)tan(0.813°) + 29 ---------- 66=_____

67. (deg) tan(34° – 60.6°) + 0.265 ---------- 67=_____

68. (rad) (3490)cos(40.9) ---------- 68=_____

69. (rad) tan[(0.461 – 1.11)(0.862)] ---------- 69=_____

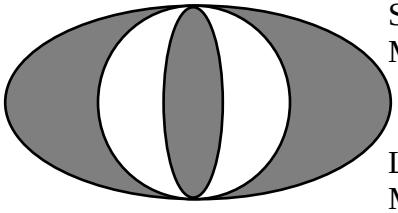
70. $(13 + 1.83 + 16.4)^{4/5}$ ---------- 70=_____

71. Calculate the slope of the line that passes through the points (8, -3) and (-1, 5). ---------- 71=_____

72. Calculate the discriminate of the following quadratic equation.

$9x^2 - 3x + 5 = 0$ 72=_____

CIRCLE AND ELLIPSES

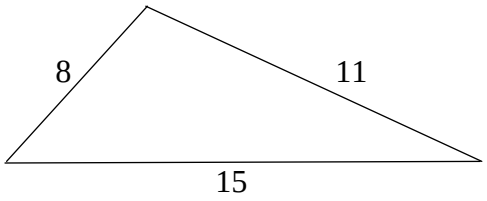


Small Ellipse
Minor Axis = 5.08
Large Ellipse
Major Axis = 25.4
Large Ellipse
Minor Axis = 9.53

Shaded Area = ?

73=_____

SCALENE TRIANGLE



Area = ?

74=_____

75. $\dfrac{\text{Log}(1.90\text{x}10^{8} + 2.85\text{x}10^{7})}{1.42}$ ---------- 75=_____

76. $\dfrac{11.3 + \sqrt{(8.46)(24.9)} + (2.55)(8.59)}{\sqrt{\sqrt{0.0303 + 0.101}}}$ ---------- 76=_____

77. $\text{Log}(2800 + 6470 + 1640)$ ---------- 77=_____

78. $\text{Ln}\left[\dfrac{15.8 + 13.7 + 18.7}{74.3 - 37.7 - 24.6}\right]$ ---------- 78=_____

79. $1 + 3 + 5 + \ldots + 861$ ---------- 79=_____

80. $1 + (0.289) + \dfrac{(0.289)^2}{2} + \dfrac{(0.289)^3}{6} + \dfrac{(0.289)^4}{24}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Kick-Off On-Line Meet Answer Key

Page 1

1 = 20.0
= 2.00×10^{1}

2 = 18.0
= 1.80×10^{1}

3 = -7.00
= -7.00×10^{0}

4 = 23.0
= 2.30×10^{1}

5 = -571
= -5.71×10^{2}

6 = 52.6
= 5.26×10^{1}

7 = -7.12
= -7.12×10^{0}

8 = -5.80
= -5.80×10^{0}

9 = 1.47×10^{7}

10 = 7.76×10^{9}

11 = 11.2
= 1.12×10^{1}

12 = 14900
= 1.49×10^{4}

13 = 14000
= 1.40×10^{4}

Page 2

14 = -3.08×10^{7}

15 = 23600
= 2.36×10^{4}

16 = 1.84
= 1.84×10^{0}

17 = 0.122
= 1.22×10^{-1}

18 = -0.611
= -6.11×10^{-1}

19 = 0.988
= 9.88×10^{-1}

20 = 1250
= 1.25×10^{3}

21 = 0.0527
= 5.27×10^{-2}

22 = -9.30
= -9.30×10^{0}

23 = 11.1
= 1.11×10^{1}

24 = 288 INT.

25 = $17.04

26 = 600 INT.

Page 3

27 = 56.0
= 5.60×10^{1}

28 = -3520
= -3.52×10^{3}

29 = -2.05×10^{12}

30 = 0.0120
= 1.20×10^{-2}

31 = 8.86×10^{-14}

32 = 7.79×10^{-10}

33 = 1.85
= 1.85×10^{0}

34 = -7.16
= -7.16×10^{0}

35 = 17.9
= 1.79×10^{1}

36 = 2.87×10^{-10}

37 = 26.6
= 2.66×10^{1}

38 = 12.8
= 1.28×10^{1}

Page 4

39 = 3.21×10^{6}

40 = 4.87×10^{7}

41 = 1.87×10^{6}

42 = 0.134
= 1.34×10^{-1}

43 = 1.33
= 1.33×10^{0}

44 = -0.437
= -4.37×10^{-1}

45 = 48800
= 4.88×10^{4}

46 = 3710
= 3.71×10^{3}

47 = 20.0
= 2.00×10^{1}

48 = 125
= 1.25×10^{2}

49 = 14.9
= 1.49×10^{1}

50 = 35.0
= 3.50×10^{1}

Page 5

51 = 1.00
= 1.00×10^{0}

52 = 5.40×10^{19}

53 = 3790
= 3.79×10^{3}

54 = 2.60
= 2.60×10^{0}

55 = 82.4
= 8.24×10^{1}

56 = 2.18×10^{-7}

57 = 4.35
= 4.35×10^{0}

58 = 2.26
= 2.26×10^{0}

59 = 0.500
= 5.00×10^{-1}

60 = 0.0192
= 1.92×10^{-2}

Page 6

61 = 14.1
= 1.41×10^{1}

62 = 9990
= 9.99×10^{3}

63 = -27.0
= -2.70×10^{1}

64 = 345
= 3.45×10^{2}

65 = -12.7
= -1.27×10^{1}

66 = 97.5
= 9.75×10^{1}

67 = -0.236
= -2.36×10^{-1}

68 = -3480
= -3.48×10^{3}

69 = -0.626
= -6.26×10^{-1}

70 = 15.7
= 1.57×10^{1}

71 = -0.889
= -8.89×10^{-1}

72 = -171
= -1.71×10^{2}

Page 7

73 = 157
= 1.57×10^{2}

74 = 42.8
= 4.28×10^{1}

75 = 5.87
= 5.87×10^{0}

76 = 79.3
= 7.93×10^{1}

77 = 4.04
= 4.04×10^{0}

78 = 1.39
= 1.39×10^{0}

79 = 186000
= 1.86×10^{5}

80 = 1.34
= 1.34×10^{0}

TMSCA 2019-2020 MS CA Kick-Off Solutions to Word and Geometry Problems

11. $\frac{4+6+8+9+10+12+14+15+16+18}{10}$

12. $\frac{172.8^2}{2}$

13. A metric ton = 1000 kg
14 x 1000

24. 72(5) – 9(8)

25. 12(1.42) Look at show key to get the exact cents.

26. $\frac{14}{25} = \frac{336}{x}$ so $x = \frac{336(25)}{14}$

INT

35. $\pi r^2 = \pi(7.125)^2$ = area of circle = area of triangle = $\frac{x^2}{2}$
So leg = x = $\sqrt{\pi(7.125)^2(2)}$

36. Each term is $3^{-(n-1)}$
First term =$3^{-(1-1)}$
Second term = $3^{-(2-1)}$
Third term = $3^{-(3-1)}$
21st term = $3^{-(21-1)}$

37. $\pi r^2 = \pi\left(\frac{5.818}{2}\right)^2$

38. Width = $\frac{666}{52.1}$

47. Interest of 5000 would double the amount in the account. I = PRT
5000 = 5000(.05)T
T = $\frac{5000}{5000(.05)}$

48. A rhombus has 360 degrees. 4x+9x +4x+9x = 360.
26x = 360. X = $\frac{360}{26}$.
The largest angle is 9 times as big.

49. $\sqrt{12.28^2 + 8.51^2}$

50. $\frac{\boldsymbol{cos(62)}}{\mathbf{1}} = \frac{\mathbf{16.41}}{\boldsymbol{x}}$

$x = \frac{16.41}{cos(62)}$

59. -8n + 22 = 18
n = $\frac{-4}{-8}$

60. $\frac{1}{52}$

61. $\frac{5.71^2\sqrt{3}}{4}$

62. $2\pi r^2 + 2\pi rh$
$= 2\pi(17)^2 + 2\pi(17)(76.5)$

71. $\frac{5-(-3)}{-1-8} = \frac{8}{-9}$

72. $\boldsymbol{ax^2 + bx + c = 0}$
Discriminant = $b^2 - 4ac = (-3)^2 - 4(9)(5)$

73. Diameter of circle = minor axis of larger ellipse. Find area of large ellipse minus area of circle plus area of small ellipse.
Large ellipse area = $\pi\left[\left(\frac{25.4}{2}\right)\left(\frac{9.53}{2}\right)\right]$
Area of circle = $\left(\frac{9.53}{2}\right)^2\pi$
Area of small ellipse = $\pi\left[\left(\frac{5.08}{2}\right)\left(\frac{9.53}{2}\right)\right]$

74. Area of scalene triangle when given the three sides = $\sqrt{s(s-a)(s-b)(s-c)}$
Where s is half of the perimeter and the three sides are a,b,c.
$s = \frac{8+15+11}{2} = 17$
A = $\sqrt{17(17-8)(17-15)(17-11)}$