8

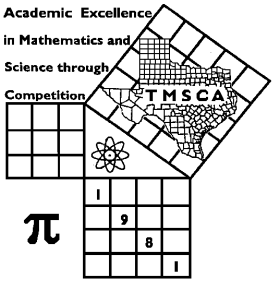
1st Score: _____	2nd Score: _____	3rd Score: _____	
S & G _____	S & G _____	S & G _____	_____. _____
Grader: _____	Grader: _____	Grader: _____	**Final Score**

PLACE LABEL BELOW

Name:_____ School:_____

SS/ID Number:_____ City:_____

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



T M S C A M I D D L E S C H O O L

C A L C U L A T O R

T E S T # 1 1 ©

F E B R U A R Y 1 5 , 2 0 2 0

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 Test #11

1. $-1670 - 2540$ ---------- 1=_____

2. $-19 + 48 + 37$ ---------- 2=_____

3. $1450 + 2390 + 637$ ---------- 3=_____

4. $\pi + 5 + 14 + 7$ ---------- 4=_____

5. $2710 - 8590 + 976 - 8590$ ---------- 5=_____

6. $118 + 118 - 96.1 - 124 - 102$ ---------- 6=_____

7. $\pi + 3.88 - 5.53 + 3.5 + 2.04$ ---------- 7=_____

8. $(2.18 - 0.645) + (4.11 - 0.896 - 2.78)$ ---------- 8=_____

9. $131 \times 387 \times 102$ ---------- 9=_____

10. $19.1 \times 257 \times 1310 \times 13.9$ ---------- 10=_____

11. Calculate the mean of the number of square inches in a square foot, the number of ounces in a gallon, the number of yards in a mile and the number days in a non-leap year. ---------- 11=_____

12. The following numbers form a Pythagorean Triple, (8, X, 17). Calculate the value of X. ---------- 12=_____INT.

13. Timothy has a collection of sports cards. The ratio of baseball to basketball to football cards is 6 to 8 to 12. If he has a total of 3,172 cards, calculate how many are football cards. ---------- 13=_____INT.

14. $(53)[81 \times 19 \times 82]$ ---------- 14=_____

15. $(157)[52 \times 93/241]$ ---------- 15=_____

16. $\{(122)(159 - 191)(88)\} - 1.31 \times 10^{5}$ ---------- 16=_____

17. $\{-472/182\}\left[\frac{371}{180 + 571}\right]$ ---------- 17=_____

18. $\left[\frac{(2670/431) - (1180/1180)}{0.291/(0.375)}\right]$ ---------- 18=_____

19. $\frac{(68/98) + (62/36)}{(\pi - 32.8)}$ ---------- 19=_____

20. $(0.0866)[85/130 \times 58/115] - 0.0125$ ---------- 20=_____

21. $\frac{0.0212 + 0.00511 + 0.0235}{(24.1)(2.75 \times 10^{-5})(0.0155)}$ ---------- 21=_____

22. $\frac{(113 \times 495)/909}{(959 \times 661) + 4.44 \times 10^{5}}$ ---------- 22=_____

23. $\frac{[-(5740 + 2350)(5170 - 4850)]}{(4.37/(20200))}$ ---------- 23=_____

24. Two rectangles have the same area. One measures 22.6 inches by 9.2 inches. Calculate the length of the second rectangle if the width is 5.1 inches. ---------- 24=_____in.

25. Mary-Ann studies for her mid-terms all week. She spent 4 hours on Monday, 3 on Tuesday, 1 on Wednesday, 5 on Thursday, 3 on Friday, 6 on Saturday and 5 on Sunday. Calculate the percentage of the hours in a week she spent studying. ---------- 25=_____%

26. The area of a square lot is fifty thousand, two hundred twenty-six square feet. Calculate the length of the diagonal of the square lot in feet. ---------- 26=_____ft.

27. $(0.00586)[(23.8/43.8)(0.00879 + 0.0464)]$ ---------- 27=_____

28. $(0.00889)\left[[0.0035/(5.46\text{x}10^{-4})][0.00316/(0.00113)]\right]$ - 28=_____

29. $\dfrac{(2.29\text{x}10^{11}) + (1.10\text{x}10^{11})}{(-0.00611)(0.0125) - 5.71\text{x}10^{-5}}$ ---------- 29=_____

30. $\dfrac{1}{181} + \dfrac{1}{(\pi)(321 - 243)}$ ---------- 30=_____

31. $[218]\left[\dfrac{1/0.0936}{1/(0.0742)}\right]$ ---------- 31=_____

32. $\dfrac{(0.00598 + 0.00763)}{(1.71\text{x}10^{11})}$ ---------- 32=_____

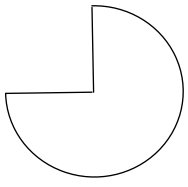
33. $\dfrac{1}{243} - \dfrac{1}{(169 + 260)}$ ---------- 33=_____

34. $1/(0.0337 - 0.0553) - 1/(-0.00519)$ ---------- 34=_____

35. Calculate the amount of money that would have to be invested at 2.55% to earn as much simple interest as $5000 at 4.5%. ------ 35=$_____

36. A metric ton is 2,204.623 pounds. One ton is a standard 2,000 pounds. Calculate what percent more a metric ton is than a ton. 36=_____%

THREE QUARTER CIRCLE

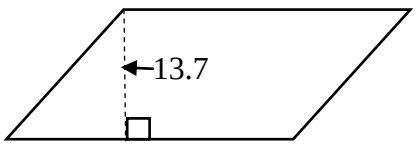


Perimeter = 273.88

Radius = ?

37=_____

PARALLELOGRAM



Area = 418

Base = ?

38=_____

39. $\sqrt[4]{\frac{2.12 + 0.67}{0.253 - 0.0498}}$ ---------- 39=_____

40. $(3840 + 1610 + 6160)^2(1.13 + 7.53)^2$ ---------- 40=_____

41. $(13.2 + 27.9)^2(15 + 7.19)^2$ ---------- 41=_____

42. $\sqrt{(1940/855) + 1.69 - 0.598}$ ---------- 42=_____

43. $(1/(4.79 \times 10^{-4}))(49400 - 39200)^2$ ---------- 43=_____

44. $(41700)\sqrt{1940 + 4810 + 3470}$ ---------- 44=_____

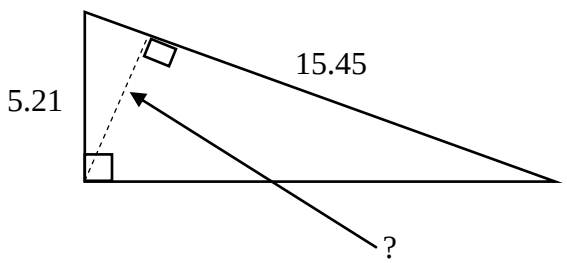
45. $(289)\sqrt{13400 + 23200 - 9060}$ ---------- 45=_____

46. $\frac{(1280 + 2730)^{1/3}}{(234 - 60.9)^{1/3}}$ ---------- 46=_____

47. Blaze takes 2 hours and 51 minutes to complete a task. Rod takes 3 hours and 4 minutes to complete the same task. Calculate how long it would take them to complete the task if they worked together. ---------- 47=_____hrs.

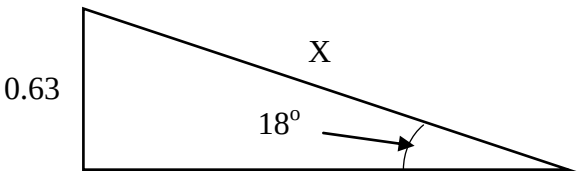
48. Calculate the measure of an interior angle of a polygon with 109 sides. ---------- 48=_____°

RIGHT TRIANGLE



49=_____

RIGHT TRISANGLE



X = ?

50=_____

51. $\left[\frac{83.6 - 81 + \sqrt{12.5/10.8}}{-1.54 + 5.78}\right]^{-4}$ ---------- 51=_____

52. $\left[\frac{\sqrt{\sqrt{373 - 129}}}{-(348 - 151)}\right]^{3}[3530 + 7040]$ ---------- 52=_____

53. $\left[\frac{26.7 + 30.9 + \sqrt{1400 + 1130}}{2.55/11.6}\right]^{2}$ ---------- 53=_____

54. $\sqrt{\frac{(8.15 \times 10^{5})(35600)}{(1.15 \times 10^{5})(1430)}} - 2.86 + 3.27$ ---------- 54=_____

55. $(4.46)^{2}\sqrt{(4.62)/(12.5)} - (3.97 + 9.55)$ ---------- 55=_____

56. $2.13 + \sqrt{(1970)/(161)} - (0.558 + 1.71)^{2}$ ---------- 56=_____

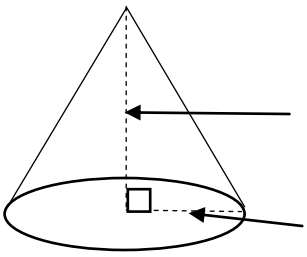
57. $\sqrt{\frac{1/(2650 - 2460)}{(8.5)(21.2 + 8.18)^{-3}}}$ ---------- 57=_____

58. $\sqrt{\frac{(47.9)(2230)}{(55.4) + (20)}} + 1/(0.404)^{4}$ ---------- 58=_____

59. Calculate the product of the roots of $12\text{-}3x^{2} = 5x$. ---------- 59=_____

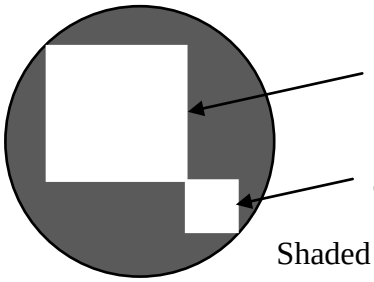
60. Calculate how many liters of a 75% acid solution must be added to 25 liters of a 10% acid solution to obtain a 50% acid solution. 60=_____l

CONE



61=_____

CIRCLE AND SQUARES



62=_____

63. $\frac{17!/10!}{11! + 12!}$ ---------- 63=_____

64. (deg) (19.9 + 15.7)sin(12.6°) ---------- 64=_____

65. (deg) (36.8 – 16.9)sin(20.6°) ---------- 65=_____

66. (deg) cos(1.33° – 4.3°) + 0.594 ---------- 66=_____

67. (deg) (6700 – 9400)sin(14.4°) + 571 ---------- 67=_____

68. (deg) $\frac{\tan(22°)}{2.99 + 1.5}$ ---------- 68=_____

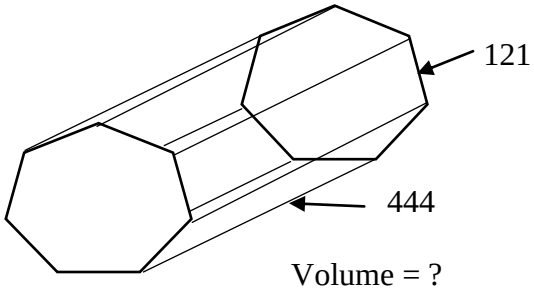
69. (rad) (4.24)cos(7.38) ---------- 69=_____

70. $(178 + 152 + 574)^{1/5}$ ---------- 70=_____

71. A bag of marbles contains 17 blue, 22 red, and 13 steelies. Calculate the probability of reaching into the bag and drawing out a steely and then a blue if the first one drawn is not replaced. -- 71=_____

72. A commuter train made the trip in 12 hours. A freight train can make the same trip in 16 hours. Calculate the rate of the freight train in mph if it was 15 mph slower than the commuter train. -- 72=_____mph

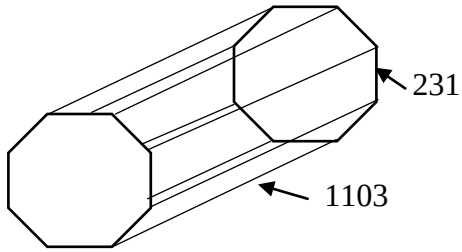
REGULAR HEPTAGONAL PRISM



Volume = ?

73=_____

REGULAR OCTAGONAL PRISM



Surface Area = ?

74=_____-

75. $\frac{\text{Log}(264 + 589)}{1.3 - 2.77}$ ---------- 75=_____

76. $\frac{(11.1)^{0.254}(0.461)^{0.804}}{(2.87 - 2.57)^{-4}}$ ---------- 76=_____

77. $\text{Log}(7280 + 13000 + 7080)$ ---------- 77=_____

78. $(2.25)^{\pi}(0.113)^{5}(1.03 - 0.43)^{2}$ ---------- 78=_____

79. $2 + 4 + 6 + \ldots + 368$ ---------- 79=_____

80. $1 + 0.23 + (0.23)^{2} + \frac{(0.23)^{4}}{8} - \frac{(0.23)^{5}}{15}$ ---------- 80=_____

2019-2020 TMSCA Middle School Calculator Test #11 Answer Key

Page 1

1 = -4210
= -4.21×10^{3}

2 = 66.0
= 6.60×10^{1}

3 = 4480
= 4.48×10^{3}

4 = 29.1
= 2.91×10^{1}

5 = -13500
= -1.35×10^{4}

6 = -86.1
= -8.61×10^{1}

7 = 7.03
= 7.03×10^{0}

8 = 1.97
= 1.97×10^{0}

9 = 5.17×10^{6}

10 = 8.94×10^{7}

11 = 599
= 5.99×10^{2}

12 = 15 INT.

13 = 1464 INT.

Page 2

14 = 6.69×10^{6}

15 = 3150
= 3.15×10^{3}

16 = -475000
= -4.75×10^{5}

17 = -1.28
= -1.28×10^{0}

18 = 6.69
= 6.69×10^{0}

19 = -0.0815
= -8.15×10^{-2}

20 = 0.0161
= 1.61×10^{-2}

21 = 4850
= 4.85×10^{3}

22 = 5.71×10^{-5}

23 = -1.20×10^{10}

24 = 40.8
= 4.08×10^{1}

25 = 16.1
= 1.61×10^{1}

26 = 317
= 3.17×10^{2}

Page 3

27 = 0.000176
= 1.76×10^{-4}

28 = 0.159
= 1.59×10^{-1}

29 = -2.54×10^{15}

30 = 0.00961
= 9.61×10^{-3}

31 = 173
= 1.73×10^{2}

32 = 7.96×10^{-14}

33 = 0.00178
= 1.78×10^{-3}

34 = 146
= 1.46×10^{2}

35 = $8823.53

36 = 10.2
= 1.02×10^{1}

37 = 40.8
= 4.08×10^{1}

38 = 30.5
= 3.05×10^{1}

Page 4

39 = 1.92
= 1.92×10^{0}

40 = 1.01×10^{10}

41 = 832000
= 8.32×10^{5}

42 = 1.83
= 1.83×10^{0}

43 = 2.17×10^{11}

44 = 4.22×10^{6}

45 = 48000
= 4.80×10^{4}

46 = 2.85
= 2.85×10^{0}

47 = 1.48
= 1.48×10^{0}

48 = 177
= 1.77×10^{2}

49 = 4.90
= 4.90×10^{0}

50 = 2.04
= 2.04×10^{0}

2019-2020 TMSCA Middle School Calculator Test #11 Answer Key

Page 5

51 = 1.77
= 1.77×10^{0}

52 = -0.0854
= -8.54×10^{-2}

53 = 241000
= 2.41×10^{5}

54 = 13.7
= 1.37×10^{1}

55 = -1.43
= -1.43×10^{0}

56 = 0.484
= 4.84×10^{-1}

57 = 3.96
= 3.96×10^{0}

58 = 75.2
= 7.52×10^{1}

59 = -4.00
= -4.00×10^{0}

60 = 40.0
= 4.00×10^{1}

Page 6

61 = 13.4
= 1.34×10^{1}

62 = 11200
= 1.12×10^{4}

63 = .189
= 1.89×10^{-1}

64 = 7.77
= 7.77×10^{0}

65 = 7.00
= 7.00×10^{0}

66 = 1.59
= 1.59×10^{0}

67 = -100
= -1.00×10^{2}

68 = 0.0900
= 9.00×10^{-2}

69 = 1.94
= 1.94×10^{0}

70 = 3.90
= 3.90×10^{0}

71 = 0.0833
= 8.33×10^{-2}

72 = 45.0
= 4.50×10^{1}

Page 7

73 = 2.36×10^{7}

74 = 2550000
= 2.55×10^{6}

75 = -1.99
= -1.99×10^{0}

76 = 0.00801
= 8.01×10^{-3}

77 = 4.44
= 4.44×10^{0}

78 = 8.47×10^{-5}

79 = 34000
= 3.40×10^{4}

80 = 1.28
= 1.28×10^{0}

TMSCA 19-20 MS CA Test #11 Solutions to Word and Geometry Problems

11. $\frac{144+128+1760+365}{4}$

12. $\sqrt{17^2-8^2}$

13. $6x+8x+12x=3172$

$$x=\frac{3172}{26}$$

Football cards are $12x$ so answer is $12\left(\frac{3172}{26}\right)$

24. $\frac{22.6(9.2)}{5.1}$

25. $\frac{4+3+1+5+3+6+5}{24(7)}=\frac{x}{100}$

Solve for x.

26. $Area\ of\ square=\frac{d^2}{2}$

where d = diagonal of square.

$$d=\sqrt{50226(2)}$$

35. $.0255x=5000(.045)$

$$x=\frac{5000(.045)}{.0255}$$

36. $\left(\frac{2204.623-2000}{2000}\right)(100)$

37. $2r+\frac{3}{4}(2\pi r)$ = 273.88

$$r\left(2+\frac{3}{2}\pi\right)=273.88$$

$$r=\frac{273.88}{2+\frac{3}{2}\pi}$$

38. $\frac{418}{13.7}$

47. $\frac{\left(2\frac{51}{60}\right)\left(3\frac{4}{60}\right)}{2\frac{51}{60}+3\frac{4}{60}}$

48. The interior angle is supplementary to the exterior angle so $180-\frac{360}{109}$

OR use $\frac{180(n-2)}{n}=\frac{180(109-2)}{109}$

49. The long leg (positioned horizontally in the picture) is $\sqrt{(15.45)^2-(5.21)^2}$

There are three similar triangles: The smallest one has a hypotenuse of 5.21 and a long leg of x. The largest triangle has a hypotenuse of 15.45 and a long leg found above.

$$\frac{x}{5.21}=\frac{\sqrt{(15.45)^2-(5.21)^2}}{15.45}$$

Solve for x.

50. $\frac{\sin(18)}{1}=\frac{.63}{x}$

$$x=\frac{.63}{sin(18)}$$

59. $0=3x^2+5x-12$

Product of the roots = $\frac{c}{a}=\frac{-12}{3}$

60. liters of solution times % acid = liters of pure acid

	Liters of sol	% acid as dec	Pure acid
1st	x	.75	.75x
2nd	25	.10	2.5
mix	x+25	.5	.5(x+25)

$$.75x+2.5=.5(x+25)$$

Solving for x: $x=\frac{10}{.25}$

61. $\frac{1}{3}\pi r^2(27.6)=5226$

$$r=\sqrt{\frac{5226(3)}{27.6\pi}}$$

62. Diagonal of the two squares are $77\sqrt{2}$ and $30.13\sqrt{2}$. The radius is

$$\frac{77\sqrt{2}+30.13\sqrt{2}}{2}$$

Shaded area is

$$\pi r^2-(77)^2-(30.13)^2$$

71. $\frac{13}{52}\cdot\frac{17}{51}$

72. ct = commuter train

ft = freight train

	rate	time	dist
ct	x+15	12	12(x+15)
ft	x	16	16x

$$12(x+15)=16x$$

$$12x+180=16x$$

$$\frac{180}{4}=x$$

73. Area of a regular polygon

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

$$\left\{\frac{(121\ x\ 7)^2}{\left[tan\left(\frac{180}{7}\right)\right](28)}\right\}(444)$$

74. $2\left\{\frac{(231\ x\ 8)^2}{\left[tan\left(\frac{180}{8}\right)\right](32)}\right\}+231(8)(1103)$