

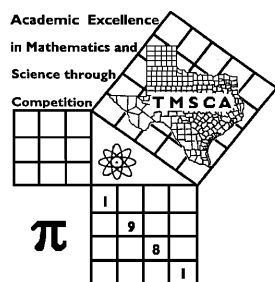
8 1st Score: _____	2nd Score: _____	3rd Score: _____	_____. ____ Final Score
S & G _____	S & G _____	S & G _____	
Grader: _____	Grader: _____	Grader: _____	

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 # 3 ©

NOVEMBER 5, 2022

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. **ALL calculators must be cleared. Calculators limited to the types specified by UIL.**

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.

2022 – 2023 TMSCA Middle School Calculator Test 3

1. $-662 - 911$ ----- 1 = _____
2. $30 - 19 - 23$ ----- 2 = _____
3. $473 + 495 + 364$ ----- 3 = _____
4. $15 - 11 - 51 + 45$ ----- 4 = _____
5. $428 - 894 - 1010 - 353$ ----- 5 = _____
6. $78.8 + 201 - 138 - 319 - 209$ ----- 6 = _____
7. $\pi + 1.67 + 0.215 + 1.37 + 1.61$ ----- 7 = _____
8. $3.95 - 3.37 + \pi - 4.46 - 3.54$ ----- 8 = _____
9. $87.5 \times 211 \times 136$ ----- 9 = _____
10. $56.3 \times 389 \times 1650 \times 41.9$ ----- 10 = _____
11. Calculate the mean of the first dozen prime numbers. ----- 11 = _____

12. Roger paid \$85.95 for 125 pounds of sand for a sandbox. Calculate the cost per pound of sand. ----- 12 = \$ _____

13. If the ordered pair (5,3) lies on the graph of $2x + 5y = k$, calculate the value of k. ----- 13 = _____

14. $(-422)[580 \times 175/582]$ ----- 14= _____

15. $373/[410 \times 50 \times 313]$ ----- 15= _____

16. $\left[\frac{136}{87}\right] [(202/36) - 0.735]$ ----- 16= _____

17. $\left[\frac{423}{328}\right] [(172/359) + 0.434]$ ----- 17= _____

18. $\left[\frac{(0.316 + 0.216)}{32/45}\right] \left[\frac{59.4}{5.76 \times 10^{-4}}\right]$ ----- 18= _____

19. $\left[\frac{328/230}{248/152}\right] \{5.57 + 31.9 - 27.2\}$ ----- 19= _____

20. $(0.427)[242/276 \times 130/135] - 0.262$ ----- 20= _____

21. $\frac{160}{(86 - 113)} - \frac{(95 - 40)}{179}$ ----- 21= _____

22. $\frac{(70.7 + 17.6 - 31.5)}{\{(46.7 - 14.8)/(0.059)\}}$ ----- 22= _____

23. $\frac{(3530 \times 767)/1290}{(1140 \times 0.864) + 788}$ ----- 23= _____

24. Calculate the difference between the supplement and complement of the smallest integral acute angle. ----- 24= _____ INT.

25. The sum of three times a number and eight is fifteen less than the opposite of the number. Calculate the value of the number. ----- 25= _____

26. A military reconnaissance plane flies at a speed of 579 miles per hour. Calculate this speed in feet per second. ----- 26= _____ fps.

27. $\frac{(0.235 + 0.128)(43.2 + 81.5)}{(2.93 \times 10^{12})}$ ----- 27= _____

28. $[340 - (791 + 575)] + [(26.2)(644 - 663)]$ ----- 28= _____

29. $\frac{(14 - 9.8)(0.0409 + 0.0444)}{(1.89 \times 10^{12})}$ ----- 29= _____

30. $[1.19] \left[\frac{1/465}{1/1590} \right]$ ----- 30= _____

31. $\frac{1}{-37.6} + \frac{1}{(9.28 - 23.4)}$ ----- 31= _____

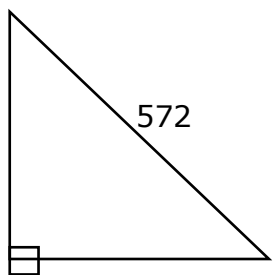
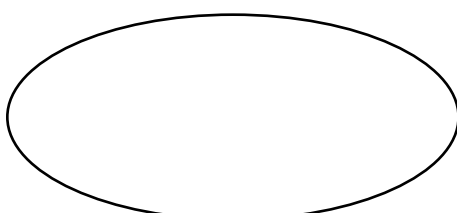
32. $(27) \left[\frac{7.61}{(7.12 \times 10^7)} \right]$ ----- 32= _____

33. $\frac{1}{57.5} - \frac{1}{(161 + 201)}$ ----- 33= _____

34. $\left[\frac{1/109}{1/112} \right] + [0.107]$ ----- 34= _____

35. In the arithmetic progression 2, 3 ½, 5, 6 ½, 8, ... calculate the value of the 16th term. ----- 35= _____

36. A father and son are mowing a field. The son uses a push mower and it takes him 12 hours. The father uses a riding mower and it takes him 5 hours. Calculate the time it would take them to mow the field if they worked together. ----- 36= _____ hrs.

<p>37. ISOSCELES RIGHT TRIANGLE</p>  <p style="text-align: center;">Leg = ?</p> <p>37= _____</p>	<p>38. ELLIPSE</p>  <p>Major Axis = 278 Minor Axis = 154</p> <p style="text-align: center;">Area = ?</p> <p>38= _____</p>
---	---

39. $\frac{(15100 + 8230)^3}{(0.0251 - 0.0473)^2}$ ----- 39= _____

40. $\left[\frac{51600 + (1/(8.20 \times 10^{-5}))}{(28400/20700) - 0.666} \right]^2$ ----- 40= _____

41. $(149 + 114 + 166)^2(11.2 + 31.4)^2$ ----- 41= _____

42. $\sqrt{1850 - 595 + 1720} - \sqrt{385}$ ----- 42= _____

43. $(1/\pi)^3 \sqrt{\frac{0.0217 + 0.0318}{0.0114 - 0.00517}}$ ----- 43= _____

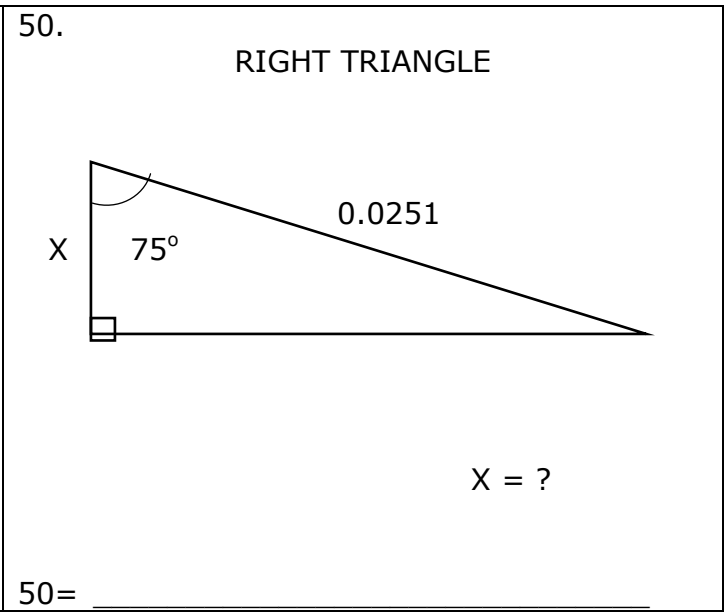
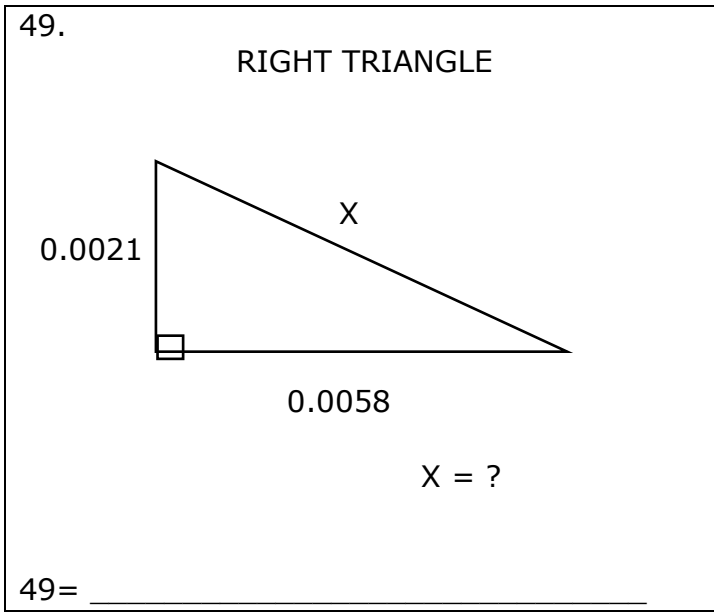
44. $\sqrt{1660} + \sqrt{1620 + 923} - (\pi)\sqrt{730}$ ----- 44= _____

45. $\left[4\sqrt{(17.9/18.4)(22.3)} \right]^2$ ----- 45= _____

46. $\frac{(710 + 561)^{1/5}}{(24600 - 7590)^{1/5}}$ ----- 46= _____

47. Calculate the x-coordinate of the intersection of the line $y = \frac{3}{4}x - \frac{5}{8}$ and the x-axis. ----- 47= _____

48. Calculate the sum of the interior angles of a dodecagon. ----- 48= _____



51. $\left[\frac{9.76 + 3.43 + \sqrt{120 + 50.3}}{24.2/25} \right]^2$ ----- 51= _____

52. $\left[\frac{\sqrt{\sqrt{0.00947 - 0.00438}}}{-(1480 - 4620)} \right]^2 [837 + 6700]$ ----- 52= _____

53. $\left[\frac{33.1 - 17.8 + \sqrt{7300/32.7}}{-2310 + 2670} \right]^3$ ----- 53= _____

54. $1130 + \sqrt{(1150)(1700)} - (1900 + 1040)$ ----- 54= _____

55. $(0.304)(9.37 \times 10^8)^{1/3} - [(68500)(3.21 \times 10^5)]^{1/4}$ ----- 55= _____

56. $(110)^2 \sqrt{(24.4)/(9.99)} - (6280 + 18600)$ ----- 56= _____

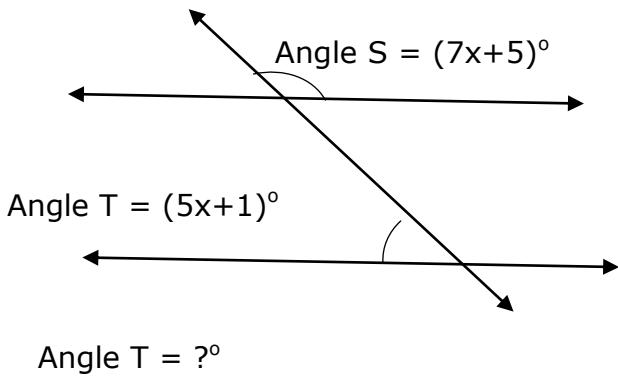
57. $\sqrt{\frac{1/(1030 - 713)}{(21.6)(11.3 + 7.34)^6}}$ ----- 57= _____

58. $(\text{rad}) \sin(5.84) + (5.2/8.1)$ ----- 58= _____

59. Calculate the value of the 13th triangular number. ----- 59= _____ INT.

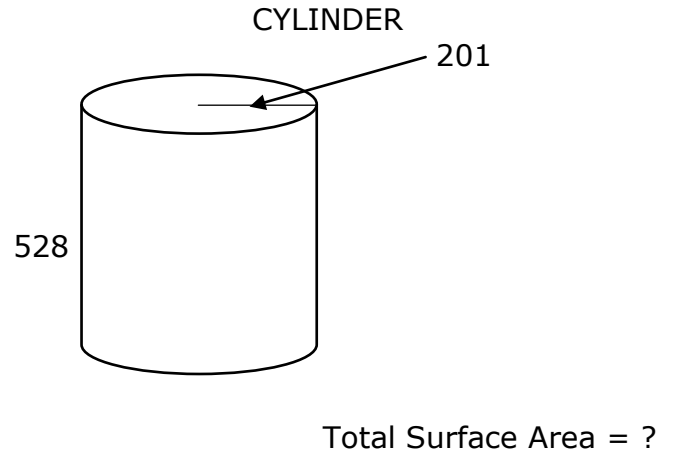
60. Calculate the probability of rolling a sum of six on a standard pair of dice. ----- 60= _____

61. PARALLEL LINES CUT BY A TRANSVERSAL



61= _____

62.



62= _____

63. $\frac{15!}{30!}$ ----- 63= _____

64. (deg) $(1180 + 465)\cos(27.6^\circ)$ ----- 64= _____

65. $(33.9 - \pi)e^{0.811}$ ----- 65= _____

66. (rad) $\frac{\cos(269)}{562/768}$ ----- 66= _____

67. (deg) $(20.4 - 13)\cos(140^\circ) + 1.71$ ----- 67= _____

68. (deg) $\frac{\sin(28.4^\circ)}{\tan(28.4^\circ)}[514]$ ----- 68= _____

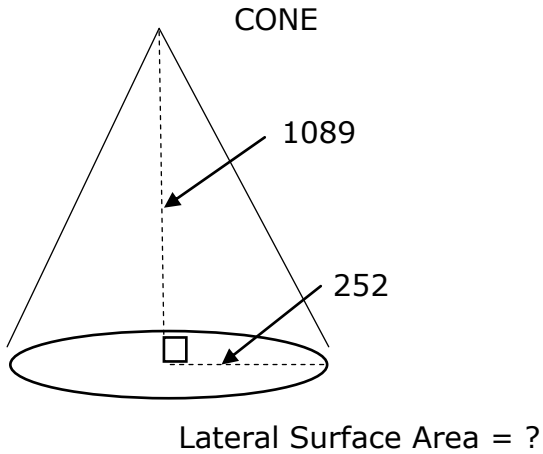
69. (rad) $(10.5)\cos(206)$ ----- 69= _____

70. $\left[(3.95)\left(\frac{11.2}{(5.04)(\pi)}\right) \right]^{1/2}$ ----- 70= _____

71. Jack and Jill are on a seesaw. Jack weighs 112 lbs. and Jill weighs 98 lbs. The fulcrum is in the middle of the seesaw and Jill is sitting 6 feet from the fulcrum. Calculate how far Jack must sit from the fulcrum to balance the seesaw. ----- 71= _____ ft.

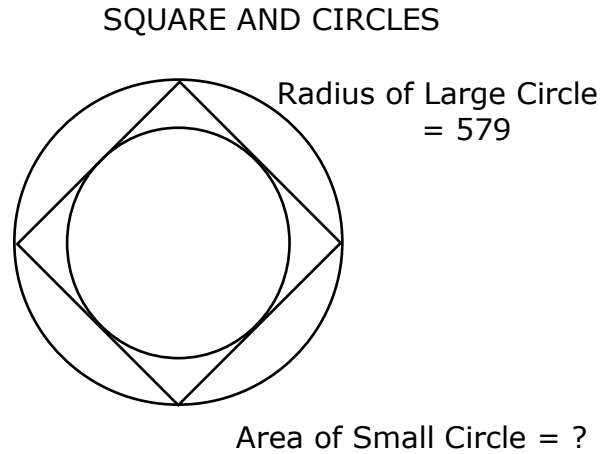
72. A field in the shape of a circle covers an area of 10 acres. Calculate the diameter of the field in feet. ----- 72= _____ ft.

73.



73= _____

74.



74= _____

75. $\frac{0.0197 + \sqrt{(0.012)(0.0316) + (0.0696)(0.151)}}{\sqrt{\sqrt{4.85 + 2.77}}}$ ----- 75= _____

76. $\frac{(0.263)^{0.921}(1.44)^{0.585}}{(7.72 - 3.39)^{-11}}$ ----- 76= _____

77. $\frac{122 - 261}{\text{Log}(13.6 + 23.8)}$ ----- 77= _____

78. $(0.295)^\pi(15)^5(0.0556 - 0.0355)^3$ ----- 78= _____

79. $1 + 3 + 5 + \dots + 337$ ----- 79= _____

80. $\frac{1}{(0.5)} + \frac{1}{3(0.5)^3} + \frac{1}{5(0.5)^5} + \frac{1}{7(0.5)^7}$ ----- 80= _____

2022 – 2023 TMSCA Middle School Calculator Test 3 Answer Key

Page 1	Page 2	Page 3	Page 4
1 = -1570 = -1.57×10^3	14 = -73600 = -7.36×10^4	27 = 1.54×10^{-11}	39 = 2.58×10^{16}
2 = -12.0 = -1.20×10^1	15 = 5.81×10^{-5}	28 = -1520 = -1.52×10^3	40 = 8.17×10^9
3 = 1330 = 1.33×10^3	16 = 7.62 = 7.62×10^0	29 = 1.90×10^{-13}	41 = 3.34×10^8
4 = -2.00 = -2.00×10^0	17 = 1.18 = 1.18×10^0	30 = 4.07 = 4.07×10^0	42 = 34.9 = 3.49×10^1
5 = -1830 = -1.83×10^3	18 = 77200 = 7.72×10^4	31 = -0.0974 = -9.74×10^{-2}	43 = 0.652 = 6.52×10^{-1}
6 = -386 = -3.86×10^2	19 = 8.98 = 8.98×10^0	32 = 2.89×10^{-6}	44 = 6.29 = 6.29×10^0
7 = 8.01 = 8.01×10^0	20 = 0.0985 = 9.85×10^{-2}	33 = 0.0146 = 1.46×10^{-2}	45 = 4.66 = 4.66×10^0
8 = -4.28 = -4.28×10^0	21 = -6.23 = -6.23×10^0	34 = 1.13 = 1.13×10^0	46 = 0.595 = 5.95×10^{-1}
9 = 2.51×10^6	22 = 0.105 = 1.05×10^{-1}		
10 = 1.51×10^9	23 = 1.18 = 1.18×10^0	35 = 24.5 = 2.45×10^1	47 = 0.833 = 8.33×10^{-1}
11 = 16.4 = 1.64×10^1	24 = 90 INT.	36 = 3.53 = 3.53×10^0	48 = 1800 = 1.80×10^3
12 = \$0.69	25 = -5.75 = -5.75×10^0	37 = 404 = 4.04×10^2	49 = 0.00617 = 6.17×10^{-3}
13 = 25.0 = 2.50×10^1	26 = 849 = 8.49×10^2	38 = 33600 = 3.36×10^4	50 = 0.00650 = 6.50×10^{-3}

2022 – 2023 TMSCA Middle School Calculator Test 3 Answer Key

Page 5

$$51 = 735$$
$$= 7.35 \times 10^2$$

$$52 = 5.45 \times 10^{-5}$$

$$53 = 0.000593$$
$$= 5.93 \times 10^{-4}$$

$$54 = -412$$
$$= -4.12 \times 10^2$$

$$55 = -87.6$$
$$= -8.76 \times 10^1$$

$$56 = -5970$$
$$= -5.97 \times 10^3$$

$$57 = 1.87 \times 10^{-6}$$

$$58 = 0.213$$
$$= 2.13 \times 10^{-1}$$

$$59 = 91 \text{ INT.}$$

$$60 = 0.139$$
$$= 1.39 \times 10^{-1}$$

Page 6

$$61 = 73.5$$
$$= 7.35 \times 10^1$$

$$62 = 921000$$
$$= 9.21 \times 10^5$$

$$63 = 4.93 \times 10^{-21}$$

$$64 = 1460$$
$$= 1.46 \times 10^3$$

$$65 = 69.2$$
$$= 6.92 \times 10^1$$

$$66 = 0.524$$
$$= 5.24 \times 10^{-1}$$

$$67 = -3.96$$
$$= -3.96 \times 10^0$$

$$68 = 452$$
$$= 4.52 \times 10^2$$

$$69 = 2.35$$
$$= 2.35 \times 10^0$$

$$70 = 1.67$$
$$= 1.67 \times 10^0$$

$$71 = 5.25$$
$$= 5.25 \times 10^0$$

$$72 = 745$$
$$= 7.45 \times 10^2$$

Page 7

$$73 = 885000$$
$$= 8.85 \times 10^5$$

$$74 = 527000$$
$$= 5.27 \times 10^5$$

$$75 = 0.0299$$
$$= 2.99 \times 10^{-2}$$

$$76 = 3.63 \times 10^6$$

$$77 = -88.4$$
$$= -8.84 \times 10^1$$

$$78 = 0.133$$
$$= 1.33 \times 10^{-1}$$

$$79 = 28600$$
$$= 2.86 \times 10^4$$

$$80 = 29.4$$
$$= 2.94 \times 10^1$$

TMSCA 2022-2023 MS CA Test 3 Solutions to Word and Geometry Problems

11. The first 12 primes are:
2,3,5,7,11,13,17,19,23,29,
31,37

Add these numbers. Then
divide by 12.

$$12. \frac{85.95}{125}$$

$$13. 2(5) + 5(3) = k$$

24. The smallest integral
angle is 1° . The supplement is
 179° and the complement is
 89° . $179-89 = 90$. Actually
the difference between the
supplement and the
complement is always 90° .

$$25. 3n + 8 = -n - 15$$

$$4n = -23; n = \frac{-23}{4}$$

$$26. 15mph = \frac{22f}{s}$$

$$\frac{15mph}{22 fps} = \frac{579}{x}$$

$$x = \frac{579(22)}{15}$$

$$35. a_n = a_1 + (n - 1)d$$

$$a_{16} = 2 + (16 - 1)(1.5)$$

$$36. \frac{12(5)}{12+5}$$

$$37. \frac{572}{\sqrt{2}}$$

$$38. \left(\frac{278}{2}\right) \left(\frac{154}{2}\right) \pi$$

$$47. 0 = \frac{3}{4}x - \frac{5}{8}; \frac{5}{8} = \frac{3}{4}x$$

$$x = \frac{5}{8} \div \frac{3}{4}$$

$$48. 180(n - 2) =$$

$$180(12 - 2)$$

$$49. \sqrt{.0021^2 + .0058^2}$$

$$50. \frac{\cos 75}{1} = \frac{x}{.0251}$$

$$x = .0251(\cos 75)$$

$$59. \frac{13 \times 14}{2}$$

60. There are 5 ways to roll a
6. (1,5),(5,1),(2,4),(4,2),(3,3)

$$\frac{5}{36}$$

$$61. 7x + 5 + 5x + 1 = 180$$

$$12x = 174; x = \frac{174}{12}$$

$$\text{Angle T} = 5x + 1$$

$$5\left(\frac{174}{12}\right) + 1$$

$$62. 2\pi r^2 + 2\pi r h$$

$$2\pi(201)^2 + 2\pi(201)(528)$$

71. weight times distance
from fulcrum on each end
equal each other.

$$112x = 98(6)$$

$$x = \frac{98(6)}{112}$$

72. 640 acres = 1 sq. mile so

$$1 \text{ acre} = \frac{1}{640} \text{ sq. mile}$$

$$10 \text{ acres} = \frac{1}{64} \text{ sq. mi}$$

$$\frac{1}{64} = \pi r^2; r = \sqrt{\frac{1}{64\pi}}$$

$$\text{Diameter} = 2\left(\sqrt{\frac{1}{64\pi}}\right)$$

Multiply by 5280 to change to
feet.

73. Lateral Surface Area =
 $\pi r l$ where l is the slant
height. $l = \sqrt{252^2 + 1089^2}$

$$\pi(252)\left(\sqrt{252^2 + 1089^2}\right)$$

74. If you sketch the radius of
each circle, a 45-45-90
triangle will form. The radius
of the small circle is a leg of
this triangle: $\frac{579}{\sqrt{2}}$

Area of small circle:

$$\pi r^2 = \pi \left(\frac{579}{\sqrt{2}}\right)^2$$