Name _____

Tie Breaker: Points scored on Stated and Geometry Problems			
	+ _____	+ _____	+ _____

5x(Last Problem Attempted)	+ _____	+ _____	+ _____
7x(Number Incorrect)	- _____	- _____	- _____
2x(Number Incorrect SDs)	- _____	- _____	- _____
TOTAL SCORE	_____	_____	_____

UIL Calculator Applications

Test 09G

(District Week 2)

DO NOT OPEN THE TEST UNTIL INSTRUCTED TO BEGIN

I. Calculator Applications rules and scoring–See UIL Constitution

II. How to write the answers

A. For all problems except stated problems 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, 0.0190, $1.90x10^{-2}$

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. Answers must be in fixed notation. The decimal point and cents are required for exact-dollar answers.

4. Significant digit problems are indicated by underlined numbers and by (SD) in the answer blank. See the UIL Constitution and Contest Manual for details.

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); exp(u) means e^{u}.

09G-1. $4.19 + 1.8 - 34.2$ ---------- 1=_____

09G-2. $-1.94/0.714 + 1.83 - 2.72$ ---------- 2=_____

09G-3. $\dfrac{(-6.92)\,(5.46)\,(-6.51)}{8.35} + 21.3$ ---------- 3=_____

09G-4. $\dfrac{(1400 - 918)}{\{\,(0.0689) / (0.0818)\,\}} + (290 - 276)$ ---------- 4=_____

09G-5. $\dfrac{(-17.9 + 10.7 - 11.5)\,(-22.9)}{(-36.8)\,(55.5)\,(73.6)}$ ---------- 5=_____

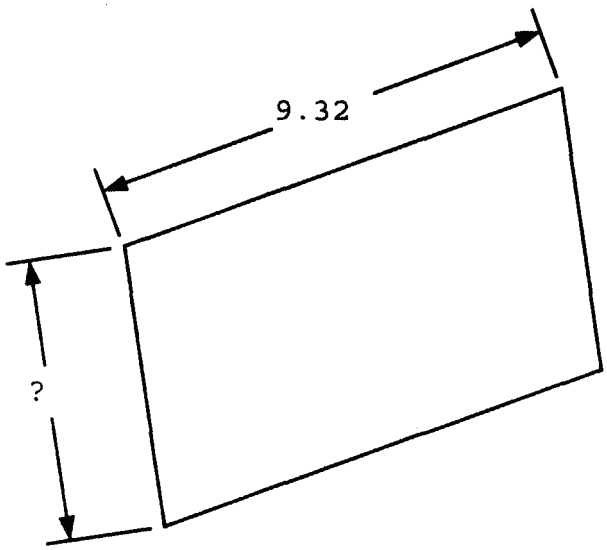
09G-6. What is the result of multiplying 38 and the square root of 945? ---------- 6=_____

09G-7. Josie averaged 58 mph on her 200 mile trip. How long did the trip take? ---------- 7=_____ min

09G-8. What is the slope of the line passing through the points (6,7) and (13,-5)? ---------- 8=_____

09G-9.

PARALLELOGRAM

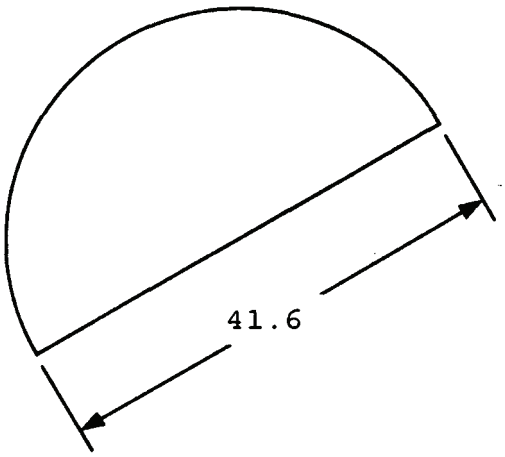


Perimeter = 30

09G-9 = _____

09G-10.

SEMICIRCLE



Area = ?

09G-10 = _____

09G-11. $\dfrac{(0.216 + 0.158)(6.98 + 7.72)}{(-1.26)(0.885)(6290 - 21400)}$ ---------- 11=_____

09G-12. $\dfrac{\{-3.03\times10^{-4} + (-0.074)(-0.0653)(-0.088)\}}{(0.81 + 1.64)(-0.0543)(3.53 + 0.637)}$ ---------- 12=_____

09G-13. $\dfrac{\{(-0.704 + 0.66)(36.6 + 39.6) + (-3.51)\}(6.64)}{(3.31)(2.38 + 5.4)(-1.25)}$ ---------- 13=_____

09G-14. $\dfrac{\{(0.843 + 1.51)(3.31 + 43.7) + 142 - 110\}}{(-138 - 128)(72.1 + 267 - 197)}$ ---------- 14=_____

09G-15. $\dfrac{(13200 + 8780 - 9210)(0.451 - 0.161 - 0.835)}{(0.0446)(0.0499)(-0.0708)(7.32 + 6.5 + 9.79)}$ ---------- 15=_____

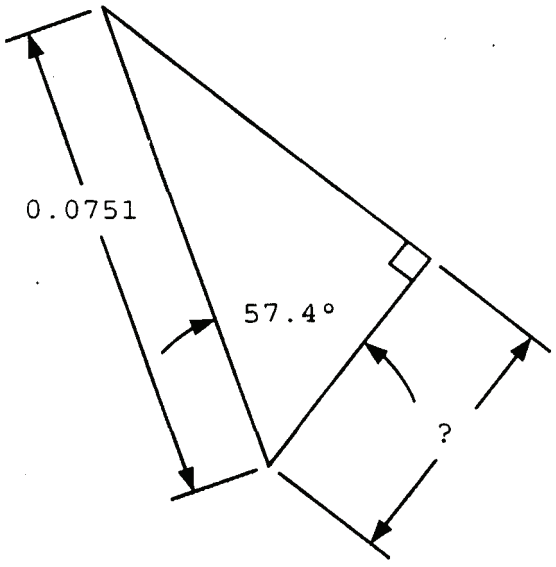
09G-16. A laser was set to output 50 watts, but the measured output was only 42 watts. What is the laser setting if it is desired to actually produce 30 watts? ---------- 16=_____ watts

09G-17. Don breathes 22 times every minute, and his rest pulse is 64 beats per minute. How long does it take for his heart to beat 1000 times more than the number of breaths he took in the same time interval? ---------- 17=_____ hr

09G-18. Israel became a nation in modern times on May 14, 1948. How old was Israel on January 1, 2009? ---------- 18=_____ days

09G-19.

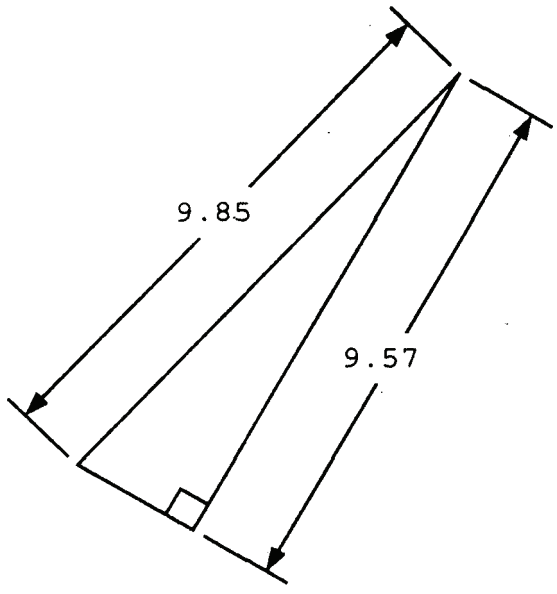
RIGHT TRIANGLE



09G-19 = _____

09G-20.

RIGHT TRIANGLE



Area = ?

09G-20 = _____

09G-21. $\dfrac{0.0316 + 1/(9.52)}{1/(0.522) + 6.94} + \dfrac{1}{(21.9)}$ ---------- 21=_____

09G-22. $\left[\dfrac{(0.603)(0.487)}{-4.46} + 0.0488\right]^2 + \sqrt{6.12\text{x}10^{-8}}$ ---------- 22=_____

09G-23. $(-4.4)(-0.223)\sqrt{(-0.766)^2 / 0.812} + 1/\sqrt{\pi + 1.25}$ ---------- 23=_____

09G-24. $\left[-25.7 + \sqrt{457}\right]^2 \text{x} [173 + 900]^2 \text{x} \sqrt{\pi / 1.07}$ ---------- 24=_____

09G-25. $\dfrac{\sqrt{313 + 310 + (1.66\text{x}10^5)/(311)}}{-824 + 339}$ ---------- 25=_____

09G-26. The monthly payment MP equals $P\left[i + \dfrac{i}{(1+i)^n - 1}\right]$ where P is the principal, i is the annual interest rate divided by 12 and n is the number of months. What is Sheila's monthly payment if she borrows $150,000 for a house at an annual interest rate of 6.47% and pays it out over 30 years? -------- 26=$_____

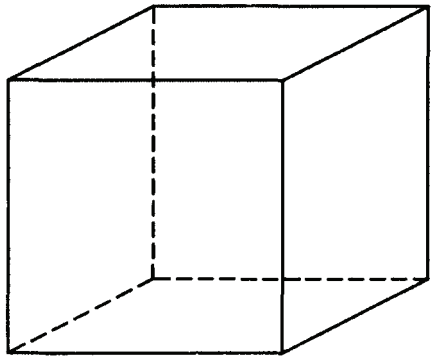
09G-27. The average annual consumption of chocolate in the US is 6.5 kg per person. This amounts to a person eating a standard 1.55 oz chocolate bar once in how many days? -------- 27=_____ days

09G-28. Irene chops 62 bell peppers in one hour, and Tim chops 45 bell peppers. Irene worked alone 1 hr, and then she was joined by Tim. How long did they work together if a total of 550 bell peppers were chopped? ---------- 28=_____ hr(SD)

09G-29.

CUBE

Volume = ?

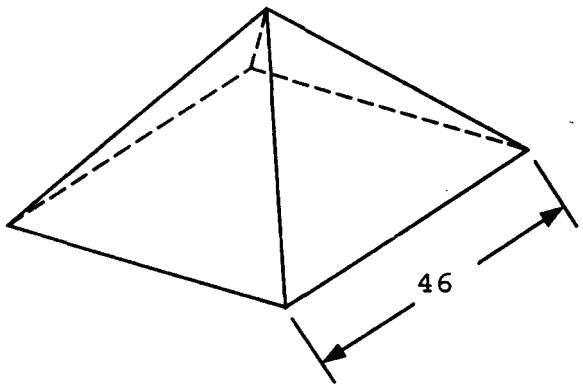


Total Surface Area = 607

09G-29 = _____

09G-30.

PYRAMID WITH EQUILATERAL TRIANGLES



Total Surface Area = ?

09G-30 = _____

09G-31. $\left[\frac{-7730}{4930 + 1220} + 1.75\right] x \left\{1290 + (-60.2)^2 - \sqrt{2.01 \times 10^7}\right\}$ --------- 31=_____

09G-32. $\sqrt{\frac{6.65}{\sqrt{82.8 + 27.9}}} x \left[\frac{1}{(6.36 - 2.66)^2} + \frac{1}{(5.91 + 2.76)^2}\right]$ ---------- 32=_____

09G-33. $\frac{[1.16 / (0.878 + 0.497) + 1 / (0.241)]^{1/2}}{(0.254 + 1.22)^2 x \sqrt{0.147 - (0.143)}}$ ---------- 33=_____

09G-34. $\frac{\sqrt{(16200) / \{(62600) / \sqrt{87400}\}}}{7.2 + (0.247)(1.19)} + \{0.63 + 4.97\}^{1/2}$ ---------- 34=_____

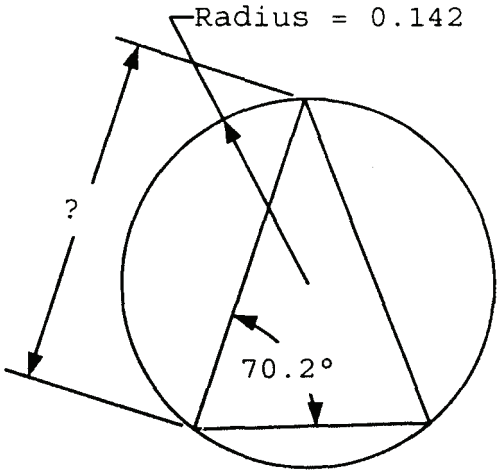
09G-35. $\frac{\left[\frac{\sqrt{0.795 + 0.96}}{(807)(70600) + (7550)^2}\right]}{\sqrt{0.142 + 0.451} + (0.54 - 0.233)^2}$ ---------- 35=_____

09G-36. In an egg toss, a strategy is to throw the egg with the lowest possible velocity but still cover the distance to the catcher. If the catcher is 25 ft from the thrower, what is this velocity? ---------- 36=_____ ft/s

09G-37. Calculate 0.0942^{-48285}. ---------- 37=_____

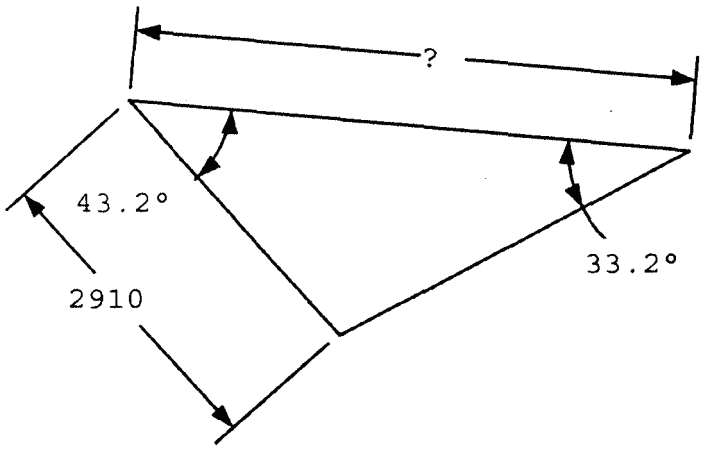
09G-38. During a footrace, a fast runner runs at a 6 min/mi pace, and a slow runner runs at a 7 min/mi pace. The fast runner passes the slow runner. After a 2 sec delay, the slow runner initiates an acceleration, catching up with the fast runner in 968 ft. What is this acceleration? ---------- 38=_____ ft/s^2

09G-39.
ISOSCELES TRIANGLE AND CIRCLE



09G-39 = _____

09G-40.
SCALENE TRIANGLE



09G-40 = _____

09G-41. $10^{-\{(0.137-0.374)/(0.851+0.134)\}}$ ---------- 41=_____

09G-42. $\dfrac{(8.37\times10^{-4})}{(-6.71\times10^{-4})}\left[1 - e^{-(0.46)(0.486)}\right]$ ---------- 42=_____

09G-43. $\dfrac{\text{Ln}(969 + 1040 - 920)}{(175)}$ ---------- 43=_____

09G-44. $(786 + 856)^{1/3}+1/\{(521)^{-0.289}\}$ ---------- 44=_____

09G-45.(deg) $\dfrac{\cos\{(70.9°)/(3.18)\}}{\sin\{174° - 183°\}}$ ---------- 45=_____

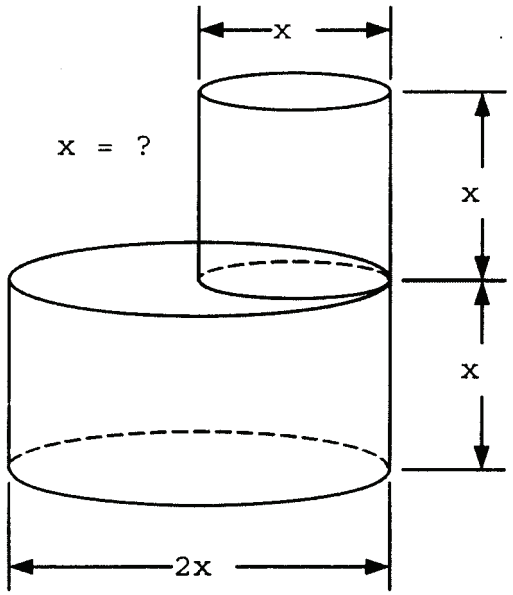
09G-46. The thickness and width of a book are each proportional to its height. One shelf holds 28 9-in tall books, which is the capacity both of the shelf length and the shelf load bearing. What is the largest number of 12-in tall books the shelf can hold? ---------- 46=_____integer

09G-47. Tensile strength is the load a part can carry divided by its cross sectional area. Aluminum cylindrical parts carried loads as a function of their diameter: (0.25 in, 1800 lbs), (0.5 in, 9000 lbs), (0.75 in, 16,500 lbs), (1 in, 32,000 lbs), (1.25 in, 50,000 lbs). Based on these results, what is the diameter required to carry a load of 22,000 lbs? - 47=_____in

09G-48. (rad) Solve for q if $q^2 + \cos(5q + 3) = 17\sqrt{q}$. ---------- 48=_____

09G-49.

CYLINDERS

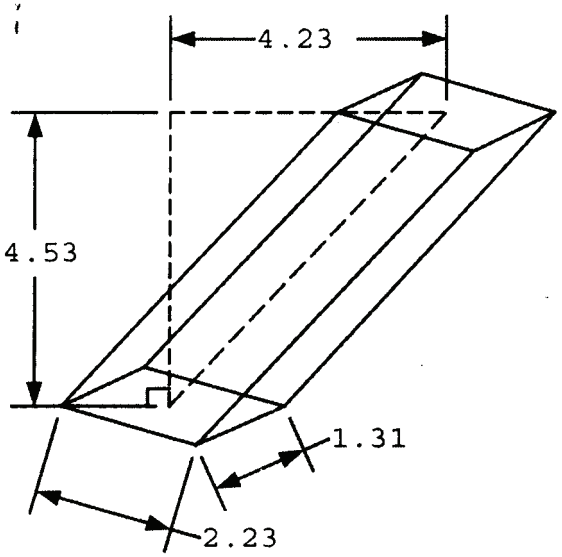


Total Surface Area = 6250

09G-49 = _____

09G-50.

SLANT RECTANGULAR SOLID



Volume = ?

09G-50 = _____

09G-51. $\dfrac{10^{(0.85)}x10^{-(0.949)} + 0.968}{10^{(1.13+0.351)}}$ ---------- 51=_____

09G-52. $\dfrac{(-3.26x10^{5} - 91000)e^{(0.7)(\pi)}}{e^{-(7.46-5.5)}}$ ---------- 52=_____

09G-53. $\dfrac{Ln(0.00113 + 0.0014)}{3.14} + \dfrac{Ln(0.736)}{0.582 - 0.349}$ ---------- 53=_____

09G-54. $\dfrac{(0.00851 + 0.0101)^{-0.456}}{(0.00565)^{-(0.954+0.88)}}$ ---------- 54=_____

09G-55.(rad) $\arctan\left[\dfrac{(2810)(0.862)}{(5.9)(41.5)}\right] + (0.818)(2.51)$ ---------- 55=_____

09G-56. (rad) What is the maximum value y for the curve $y = 2x^2\cos(x) - 4x\sin(x)$ over the region $0<x<10$? ---------- 56=_____

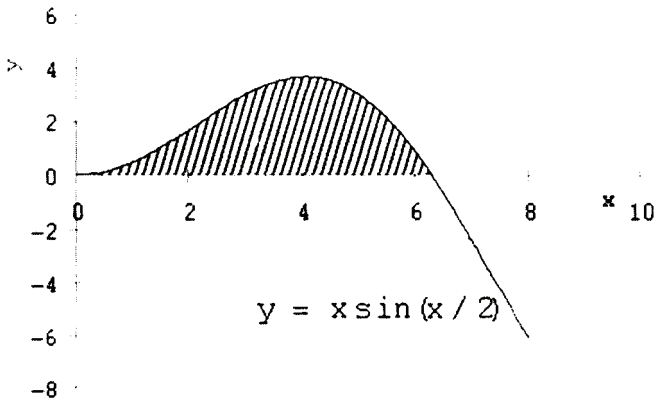
09G-57. A light sits on a pole 25 ft above ground. A ball is raised to the same height and is 35 ft away from the light. If the ball is dropped, at what ball elevation is its shadow moving at 500 ft/sec? ---------- 57=_____ ft

09G-58. Calculate Q_{13} if $\mathbf{R} = \begin{bmatrix} 4 & 16 & 12 \\ 7 & 28 & 22 \\ 22 & 7 & 2 \end{bmatrix}$, $\mathbf{S} = \begin{bmatrix} 24 & 25 & 9 \\ 29 & 28 & 7 \\ 19 & 29 & 4 \end{bmatrix}$ .and

$\mathbf{Q} = \mathbf{R} + \mathbf{S}$. ---------- 58=_____

09G-59.

RADIANS

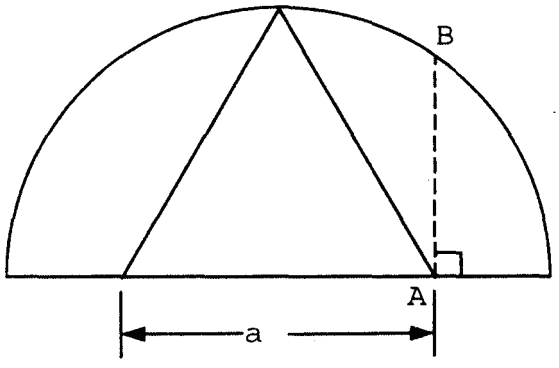


Area = ?

09G-59 = _____

09G-60.

EQUILATERAL TRIANGLE AND SEMICIRCLE



AB/a = ?

09G-60 = _____

09G-61. $2\text{Log}\sqrt{\dfrac{(0.343)\,(7.46)\,(2.99)}{(\pi)^3(6.66)^3}}$ ---------- 61=_____

09G-62. (rad) $\cos(1.04 - 0.532) - \cos(1.04 + 0.532)$ ---------- 62=_____

09G-63. (rad) $\dfrac{1}{(32800)\,(0.111)}\text{Ln}\left\{(84.4) + (-29.4)\sin(3.51)\right\}$ ---------- 63=_____

09G-64. $1 + (0.33) + \dfrac{(0.33)^2}{2} + \dfrac{(0.33)^3}{6} + \dfrac{(0.33)^4}{24}$ ---------- 64=_____

09G-65. (rad) $\dfrac{\arctan\left\{e^{-(0.931)\,(0.411)\sqrt{(-1.53)/(-1.93)}}\right\}}{(6.53)\sqrt{(9.08)\,(8.65)\,(6.87)}}$ ---------- 65=_____

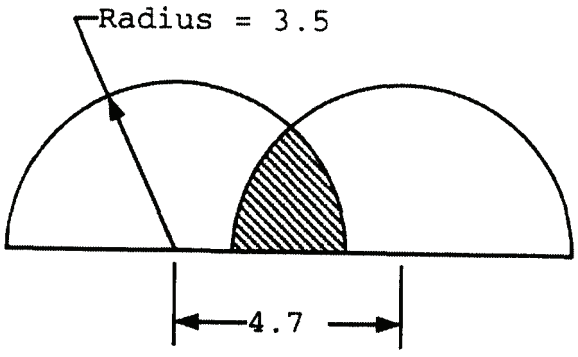
09G-66. In a dodge ball game, a player throws a ball in an attempt to hit a person 25 ft away. If the ball is thrown at 42 mph and a person's move reflex takes 150 ms to initiate, how much time does the person have to "dodge" the ball? ------ 66=_____ ms

09G-67. A towel weighs 4.6 lbs soaking wet but only 2.1 lbs when 86% of the water is wrung out. What does it weigh after it dries? ---------- 67=_____ lbs

09G-68. The pressure of an ideal gas is directly proportional to the amount of gas present and inversely proportional to the volume of the container. A certain amount of gas was placed in a 2-ft long tank and the pressure was 80 psi. The same amount of gas was placed in a 10-ft long tank of identical shape and then the contents of both tanks were mixed to get the same pressure in each. What is the final pressure? ------ 68=_____ psi

09G-69.

CONGRUENT SEMICIRCLES



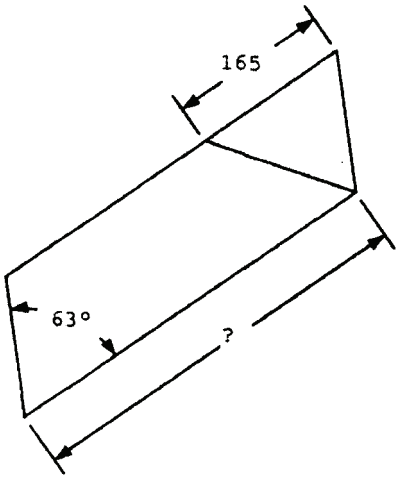
Hatched Area = ?

09G-69 = _____

09G-70.

TRAPEZOID, PARALLELOGRAM

$\dfrac{\text{Trapezoid Area}}{\text{Parallelogram Area}} = 0.8$



09G-70 = _____

09G-1 = -28.2
= -2.82×10^{1}

09G-2 = -3.61
= -3.61×10^{0}

09G-3 = 50.8
= 5.08×10^{1}

09G-4 = 586
= 5.86×10^{2}

09G-5 = -0.00285
= -2.85×10^{-3}

09G-6 = 1170
= 1.17×10^{3}

09G-7 = 207
= 2.07×10^{2}

09G-8 = -1.71
= -1.71×10^{0}

09G-9 = 5.68
= 5.68×10^{0}

09G-10 = 680
= 6.80×10^{2}

09G-11 = 0.000326
= 3.26×10^{-4}

09G-12 = 0.00131
= 1.31×10^{-3}

09G-13 = 1.42
= 1.42×10^{0}

09G-14 = -0.00377
= -3.77×10^{-3}

09G-15 = 1.87×10^{6}

09G-16 = 35.7
= 3.57×10^{1}

09G-17 = 0.397
= 3.97×10^{-1}

09G-18 = 22100
= 2.21×10^{4}

09G-19 = 0.0405
= 4.05×10^{-2}

09G-20 = 11.2
= 1.12×10^{1}

09G-21 = 0.0611
= 6.11×10^{-2}

09G-22 = 0.000538
= 5.38×10^{-4}

09G-23 = 1.31
= 1.31×10^{0}

09G-24 = 3.69×10^{7}

09G-25 = -0.0701
= -7.01×10^{-2}

09G-26 = $945.14

09G-27 = 2.47
= 2.47×10^{0}

09G-28 = 4.56 (3SD)
= 4.56×10^{0}

09G-29 = 1020
= 1.02×10^{3}

09G-30 = 5780
= 5.78×10^{3}

09G-31 = 212
= 2.12×10^{2}

09G-32 = 0.0686
= 6.86×10^{-2}

09G-33 = 16.3
= 1.63×10^{1}

09G-34 = 3.53
= 3.53×10^{0}

09G-35 = 1.34×10^{-8}

09G-36 = 28.4
= 2.84×10^{1}

09G-37 = 8.96×10^{49537}

09G-38 = 0.0798
= 7.98×10^{-2}

09G-39 = 0.267
= 2.67×10^{-1}

09G-40 = 5170
= 5.17×10^{3}

09G-41 = 1.74
= 1.74×10^{0}

09G-42 = -0.250
= -2.50×10^{-1}

09G-43 = 0.0400
= 4.00×10^{-2}

09G-44 = 17.9
= 1.79×10^{1}

09G-45 = -5.91
= -5.91×10^{0}

09G-46 = 11 integer

09G-47 = 0.832
= 8.32×10^{-1}

09G-48 = 6.62
= 6.62×10^{0}

09G-49 = 19.9
= 1.99×10^{1}

09G-50 = 13.2
= 1.32×10^{1}

09G-51 = 0.0583
= 5.83×10^{-2}

09G-52 = -2.67×10^{7}

09G-53 = -3.22
= -3.22×10^{0}

09G-54 = 0.000464
= 4.64×10^{-4}

09G-55 = 3.52
= 3.52×10^{0}

09G-56 = 79.0
= 7.90×10^{1}

09G-57 = 19.2
= 1.92×10^{1}

09G-58 = 21.0
= 2.10×10^{1}

09G-59 = 12.6
= 1.26×10^{1}

09G-60 = 0.707
= 7.07×10^{-1}

09G-61 = -3.08
= -3.08×10^{0}

09G-62 = 0.875
= 8.75×10^{-1}

09G-63 = 0.00125
= 1.25×10^{-3}

09G-64 = 1.39
= 1.39×10^{0}

09G-65 = 0.00360
= 3.60×10^{-3}

09G-66 = 256
= 2.56×10^{2}

09G-67 = 1.69
= 1.69×10^{0}

09G-68 = 1.27
= 1.27×10^{0}

09G-69 = 4.13
= 4.13×10^{0}

09G-70 = 413
= 4.13×10^{2}