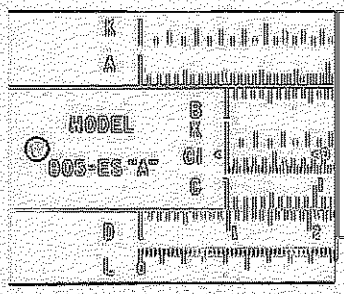

Texas Competitive Mathematics
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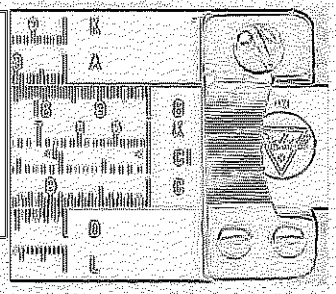
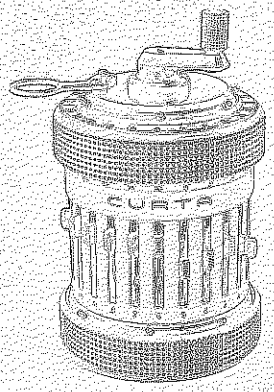
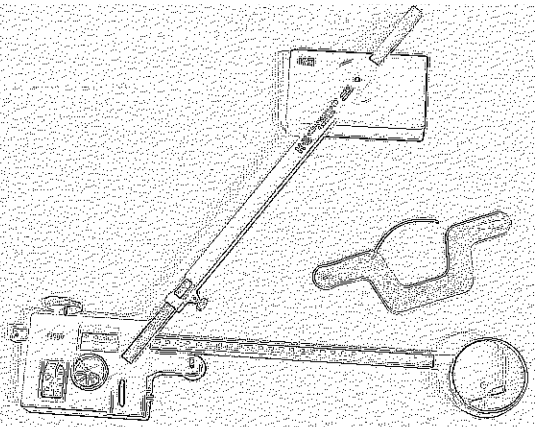
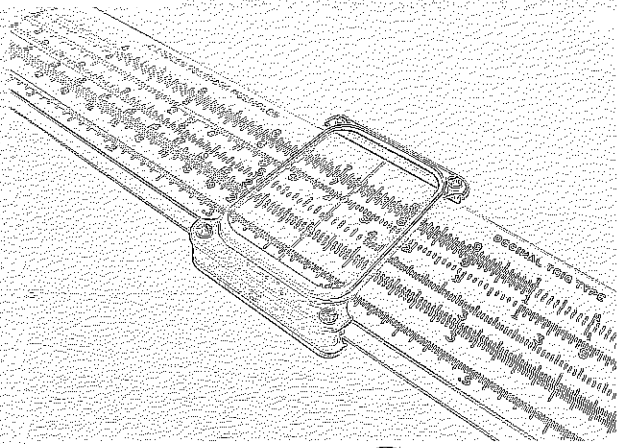
Fax - (866) 606-3535
E-Mail - webmaster@texasmath.org

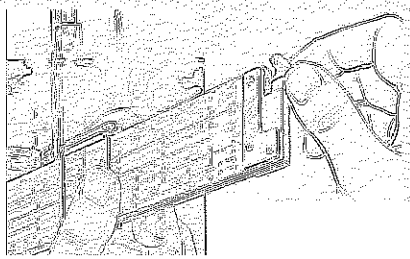


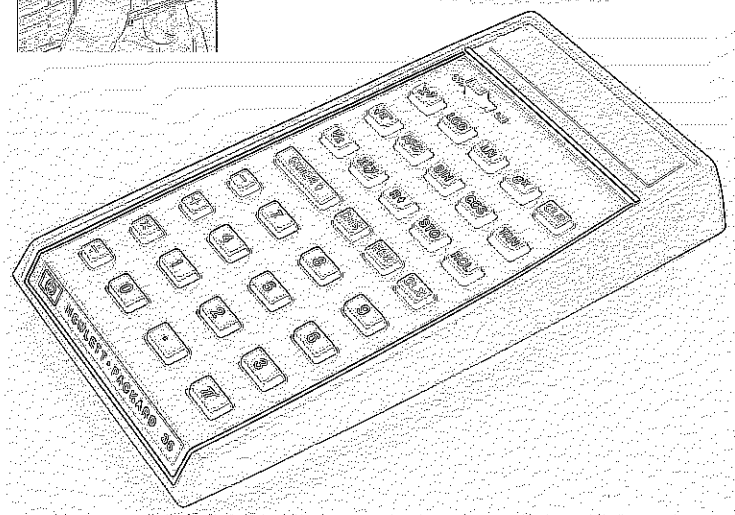
2008 UIL Calculator Appl District 2
(11 pages)

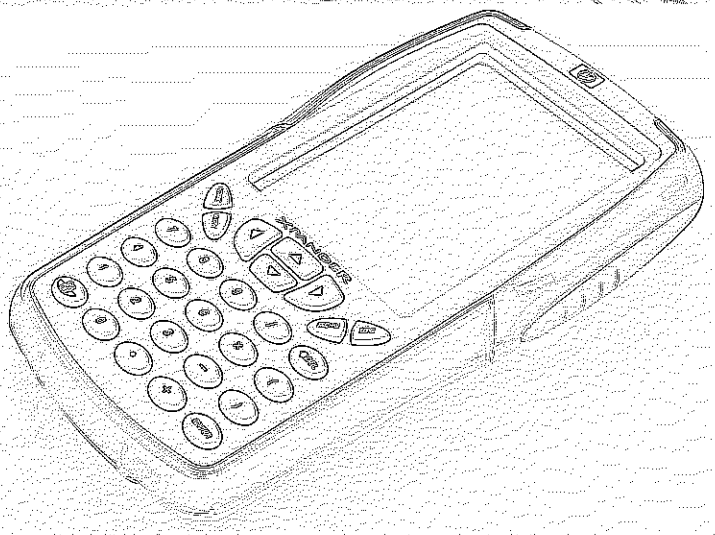


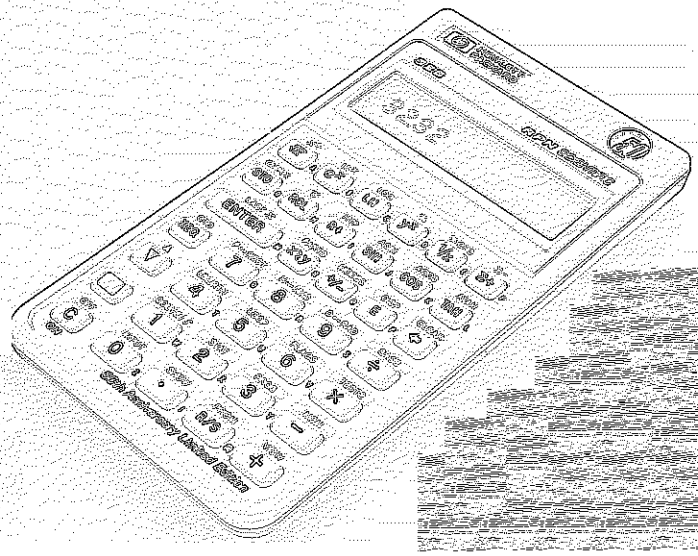


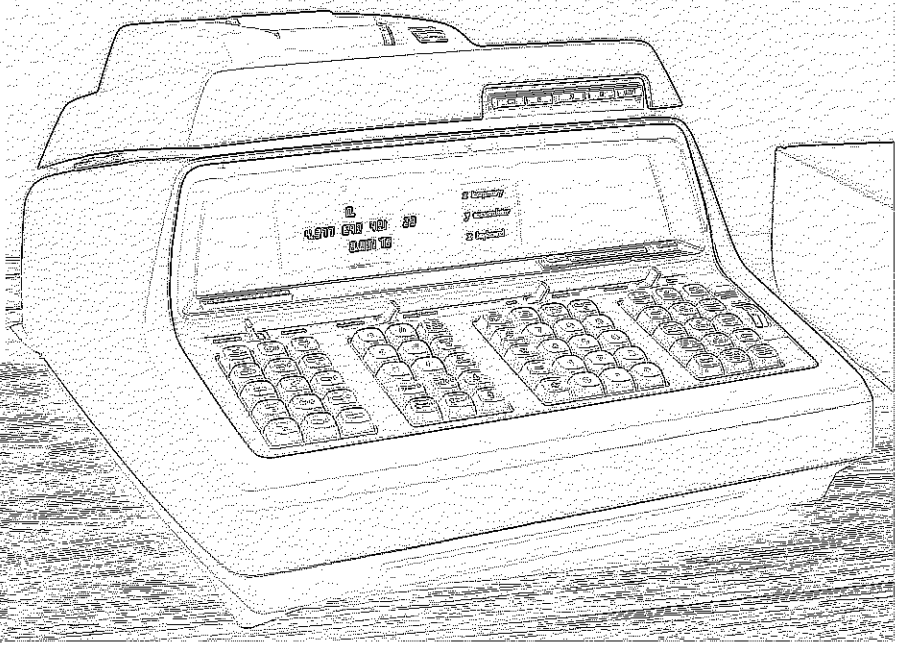












Name _____

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 08G

(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, $1.23(10)^{2}$, $1.23 \cdot 10^{2}$, $1.230x10^{2}$, $1.23*10^{2}$, 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}.

08G-1. $(38.8 + 87.6) \times 61.1$ ---------- 1=_____

08G-2. $(-9.46 - 5.37)/(7.36) + 0.691$ ---------- 2=_____

08G-3. $(-0.43 - 0.123 - 0.146 + 0.0542) \times (0.403)$ ---------- 3=_____

08G-4. $\dfrac{(5750 - 5100)}{\{(920)/(660)\}} + (449 - 148)$ ---------- 4=_____

08G-5. $\dfrac{(-0.00334 - 0.00295)(-0.0704)}{\{(0.078)/(0.0871)\}} - (6.53\times10^{-4} - 4.80\times10^{-4})$ ---- 5=_____

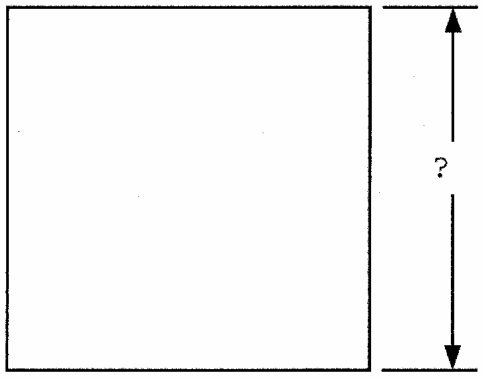
08G-6. What is the reciprocal of the square of the product of 0.0748 and -8080? ---------- 6=_____

08G-7. The diameter of a golf ball is 1.68 in, and a beachball is 1.22 ft in diameter. What is the dimensionless ratio of their diameters, a number greater than one? ---------- 7=_____

08G-8. According to the Americans with Disabilities Act, a wheelchair ramp is specified to have one inch of rise for every (horizontal) foot of run. How many 8-ft long sheets of plywood are needed to make a wheelchair ramp that makes a vertical rise of 4 ft 7 in? ---------- 8=_____ integer

08G-9.

SQUARE

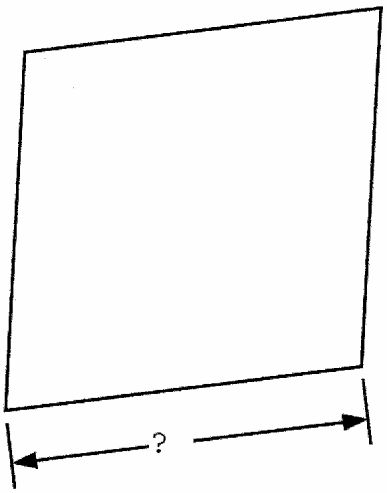


AREA = 34

08G-9 = _____

08G-10.

RHOMBUS



PERIMETER = 684

08G-10 = _____

08G-11. $\dfrac{(-0.398)(-4.89) + (-7.18)(-0.431)}{-0.923 + 0.069 - (\pi)(0.53)}$ ---------- 11=_____

08G-12. $\dfrac{0.851(4.69\text{x}10^{-5} + 2.78\text{x}10^{-5})}{(662 - 684)(0.316)} - \dfrac{-3.72\text{x}10^{-6}}{0.75 - 0.158}$ ---------- 12=_____

08G-13. $\dfrac{(-6.85\text{x}10^{-5} - 1.26\text{x}10^{-4})\{-14 + (-1.95)(3.56)\}}{(-9.46)(-0.578 + 0.121)(4.64)(5.88)}$ ---------- 13=_____

08G-14. $\dfrac{\{(0.486 + 0.584)(1.69 + 24.1) + 38.6 - \pi\}}{(-761 - 602)(67.9 + 240 - 164)}$ ---------- 14=_____

08G-15. $\dfrac{51700 + 3.41\text{x}10^{5} - (21100 + 41900)(5.9 - 4.29)}{(-512)(-898)(-462)(988 - 1600 + 3580)}$ ---------- 15=_____

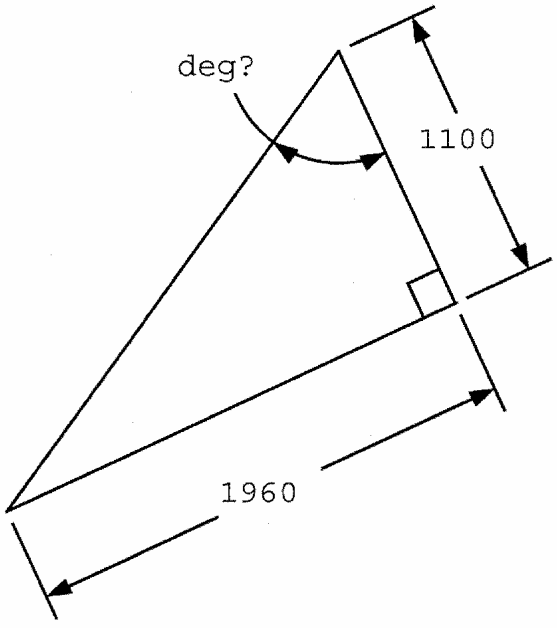
08G-16. What number when added to the numerator and denominator of 3/8 yields $-\pi$? ---------- 16=_____

08G-17. Robert bought a car. Insurance is $120/mo, and gas is $3/gal. If he gets 18 mi/gal, how far can he drive each week if his annual budget for driving is $2500? --------- 17=_____ mi

08G-18. The shutter on a digital camera moves 0.05 inches to open and 0.05 inches to shut when a photo is taken. At an exposure of (1/4000) second, 10% of the exposure is associated with opening and closing of the shutter. What is the average velocity of the shutter? ---------- 18=_____ mph

08G-19.

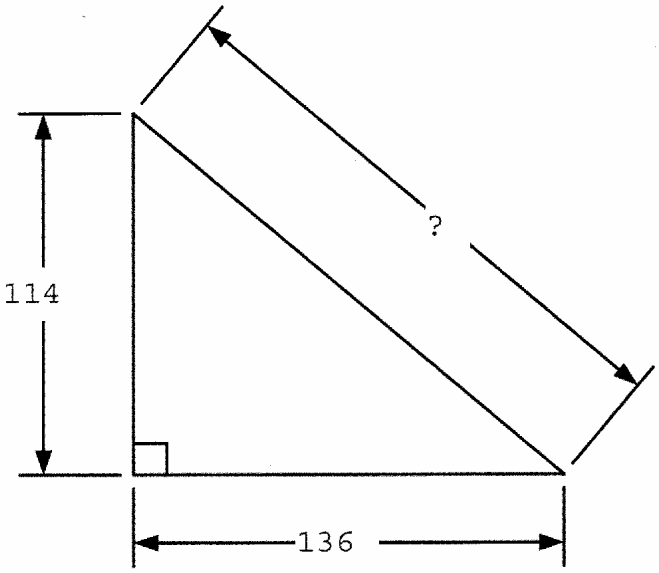
RIGHT TRIANGLE



08G-19 = _____

08G-20.

RIGHT TRIANGLE



08G-20 = _____

08G-21. $\left[\frac{\sqrt{1.76 - 0.956}}{-3.07} + \frac{(-0.752)}{3.12}\right]^2$ ---------- 21=_____

08G-22. $\sqrt{\frac{(0.0198)(\pi)}{769 + 659}} + 0.00209$ ---------- 22=_____

08G-23. $[-69.1 + \sqrt{3790}]^2 \times [270 + 440]^2 \times \sqrt{1.63/3.47}$ ---------- 23=_____

08G-24. $(44.2)(0.0182)\sqrt{(-0.941)^2/0.614} + 1/\sqrt{0.375 + 1.56}$ ---------- 24=_____

08G-25. $\frac{\sqrt{0.0663 + 0.0515 + (0.00445)/(0.0808)}}{-0.0907 + 0.0864}$ ---------- 25=_____

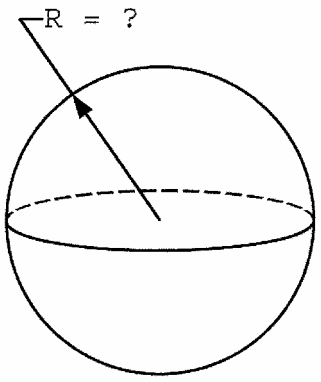
08G-26. Abby hikes 3 mi in 33 min 48 s, but she runs this distance at a 7 min 57 s per mi pace. What is the percent difference in her running and hiking time for 3 mi? ---------- 26=_____ %(SD)

08G-27. The Rankine absolute temperature scale is approximately the Fahrenheit temperature plus 459.67. What temperature in Rankine equals the negative of the temperature in Centigrade? ---------- 27=_____ °R

08G-28. An insect pest population doubles every 18 days. If an insecticide kills 90% of the insects, how often should it be applied to keep in insect population in check? ---------- 28=_____ days

08G-29.

SPHERE

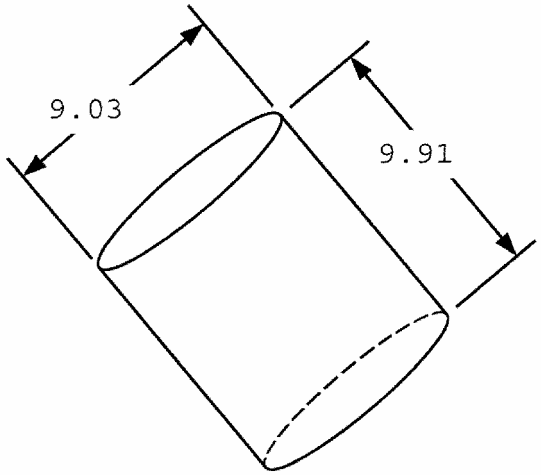


VOLUME = 654

08G-29 = _____

08G-30.

CYLINDER



TOTAL SURFACE AREA = ?

08G-30 = _____

08G-31. $\sqrt{\dfrac{2.97}{\sqrt{61 + 36.6}}} \times \left[\dfrac{1}{(3.8 - 0.58)^2} + \dfrac{1}{(6.16 + \pi)^2}\right]$ ---------- 31=_____

08G-32. $\dfrac{1}{0.00956} + \dfrac{1}{\sqrt{6.75 \times 10^{-4}}} + \dfrac{(4.92 + 6.34 - \pi)^2}{\sqrt{0.995 - 0.313}}$ ---------- 32=_____

08G-33. $\dfrac{[(38000 - 23400)(0.329/0.903)]^{1/2}}{(0.369)^2 + (0.221 + 0.259)^2 + 0.153}$ ---------- 33=_____

08G-34. $\dfrac{[0.00166/(0.664 + 0.194) + 1/(491)]^{1/2}}{(627 + 634)^2 \times \sqrt{3430 - (-860)}}$ ---------- 34=_____

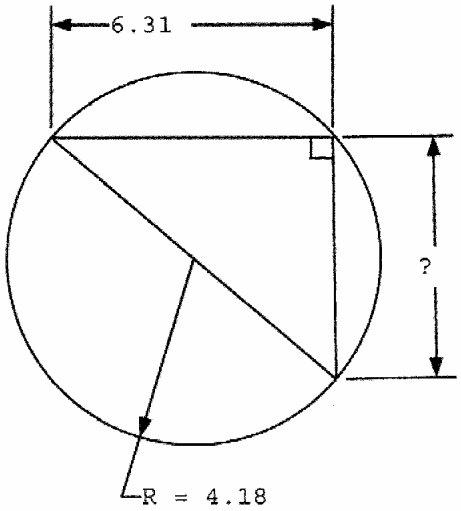
08G-35. $\dfrac{(-53.3 + 57.4)^2 - (117 - 41.6)^2}{\sqrt{(20.3)(0.845)(891 + 683 - 1610)^2}}$ ---------- 35=_____

08G-36. Two boats leave each other, one traveling northeast at 8 knots and the other traveling east at 12 knots. How long does it take them to be 100 mi apart if a knot is 1.15 mph? ---------- 36=_____ hr

08G-37. A firework travels straight up to a maximum height of 270 ft before exploding. What was the release velocity? ---------- 37=_____ mph

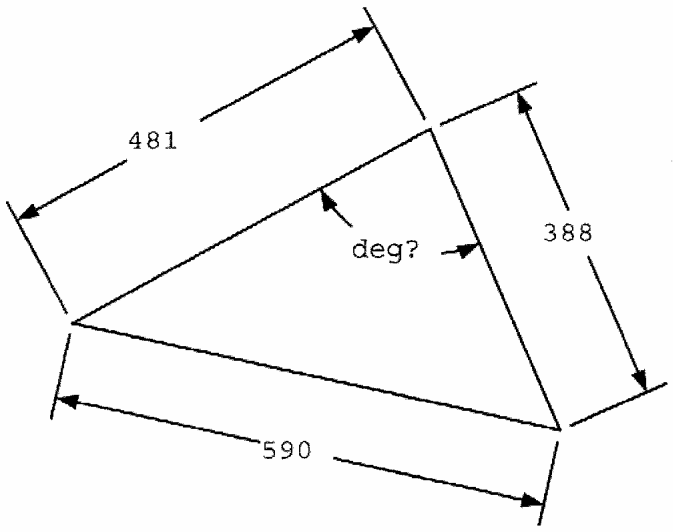
08G-38. A large amount of dough is rolled out and as many circular cookies as possible are cut from the rolled-out dough. The remaining dough is piled together, rerolled and more circular cookies are similarly cut. What percent of the original amount of dough is left over? ---------- 38=_____ %

08G-39.
RIGHT TRIANGLE AND CIRCLE



08G-39 = _____

08G-40.
SCALENE TRIANGLE



08G-40 = _____

08G-41. $\dfrac{10^{-(8.23 - 9.74)}}{959 + 921}$ ---------- 41=_____

08G-42. $\dfrac{e^{+0.149} + e^{-0.864}}{(0.0441 + 0.00606)}$ ---------- 42=_____

08G-43. $\dfrac{\text{Ln}(3.46 + 7.33 - 0.457)}{(-6.77)}$ ---------- 43=_____

08G-44. $(-0.816 + 2.16)^{-(0.267 + 0.668)}$ ---------- 44=_____

08G-45.(deg) $\sin\left[90° \times \dfrac{(-0.953)}{(2.53)}\right] + \cos\{180° - 84.6°\}$ ---------- 45=_____

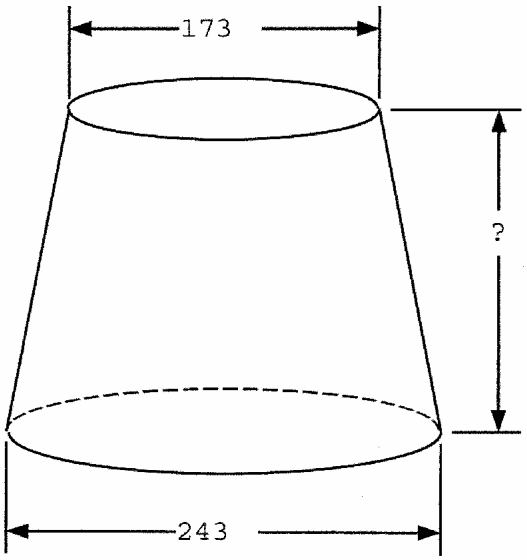
08G-46. The cost of a pearl is proportional to the square of the diameter. If a 17-in long, single-strand pearl necklace with 7 mm diameter pearls costs $850, what is the necklace cost if 10 mm pearls were used? The necklace holds the maximum number of pearls, and pearls cannot be split. -------- 46=$_____

08G-47. The number of tree leaves scales with the square of its height. What is the best-fit estimate for the number of leaves on a 40-ft tree based on these (height, leaves) data: (5 ft, 3000), (10 ft, 15,000), (15 ft, 27,000), (20 ft, 52,000), (25 ft, 77,000)? ---------- 47=_____ leaves

08G-48. (rad) Solve for negative k if $(9-k)^{-5}\cos(k) = 6-k^2$. -- 48=_____

08G-49.

FRUSTUM

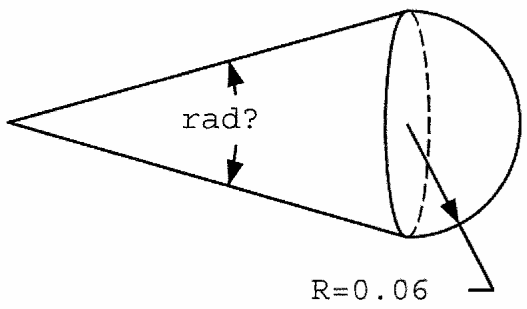


TOTAL SURFACE AREA = 190,000

08G-49 = _____

08G-50.

CONE AND HEMISPHERE



TOTAL VOLUME = 0.0013

08G-50 = _____

08G-51. $\dfrac{(0.0248)\ 10^{-(5.24\ -\ 3.76)}}{0.09\ +\ 0.0128}$ ---------- 51=_____

08G-52. $\dfrac{428\ +\ e^{(4.56\ +\ 1.51)}}{0.247\ -\ e^{-(0.725\ -\ 0.815)}}$ ---------- 52=_____

08G-53. $\dfrac{(7.12\text{x}10^{-4}\ +\ 0.00353)\ \text{Log}\{1/757\}}{\text{Log}\{(847)/(801\ +\ 1020)\}}$ ---------- 53=_____

08G-54. $\dfrac{(5.76)^{0.4}\ -\ (6.74)^{-0.373}}{-94100\ +\ 15700}$ ---------- 54=_____

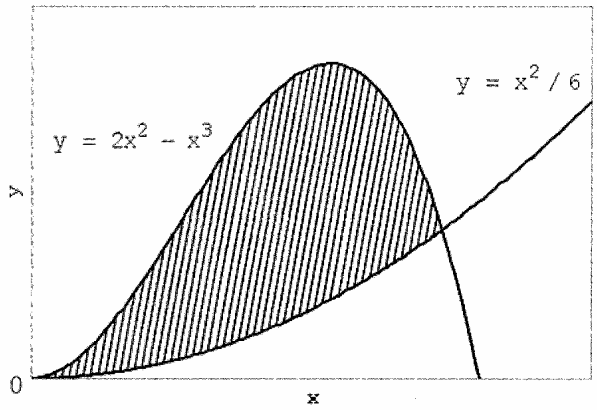
08G-55.(rad) $\arctan\left[\dfrac{(2160)\,(0.643)}{(8.02)\,(99.9)}\right]\ +\ (0.478)\,(2.93)$ ---------- 55=_____

08G-56. What is the absolute value of the area bounded by the x-axis and $y = -6x^2+25x-17$? ---------- 56=_____

08G-57. A cube originally with side dimension a= 3 cm begins to expand at 7 cm^3/s. At what rate is the surface area changing when a = 7 cm? ---------- 57=_____ cm^2/s

08G-58. If [**A**] = $\begin{bmatrix} 8 & 5 & 5 \\ 8 & -9 & 4 \\ -4 & 7 & 9 \end{bmatrix}$ and [**B**] = $\begin{bmatrix} -5 & 6 & 6 \\ -8 & 8 & 2 \\ 4 & 9 & 3 \end{bmatrix}$, solve Det[**C**] if [**C**] = 5[**A**]+9[**B**]. ---------- 58=_____

08G-59.

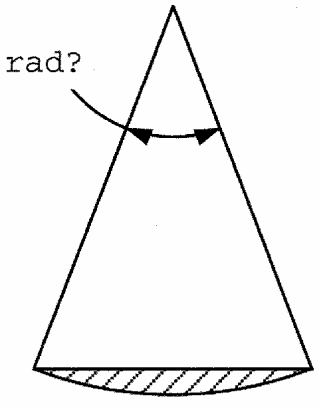


HATCHED AREA = ?

08G-59 = _____

08G-60.

ISOSCELES TRIANGLE AND SEGMENT



AREA(TRIANGLE) = 2190
AREA(SEGMENT) = 209

08G-60 = _____

08G-61. $\dfrac{(10^{1.8})(10^{8.57})(10^{0.514})}{10^{\{(6.35)(0.339)\}}}$ ---------- 61=_____

08G-62. $(8.81)10^{\text{Log}[(9.48)(0.855)]} + \{(7180)(0.926)\}^{1/2}$ ---------- 62=_____

08G-63. (rad) $\dfrac{1}{(18600)(0.111)}\,\text{Ln}\{(1.61) + (-1.21)\sin(3.24)\}$ ---------- 63=_____

08G-64. $1 + 0.699 + (0.699)^2 + \dfrac{(0.699)^4}{8} - \dfrac{(0.699)^5}{15}$ ---------- 64=_____

08G-65. $\dfrac{(-5.06)}{(-4.93)} - \dfrac{(-2.57)}{(-1.52)^2}\,\text{Ln}\left[\dfrac{(-0.033)^2 + (8.69\text{x}10^{-4})}{(-9.62) + \sqrt{140}}\right]$ ---------- 65=_____

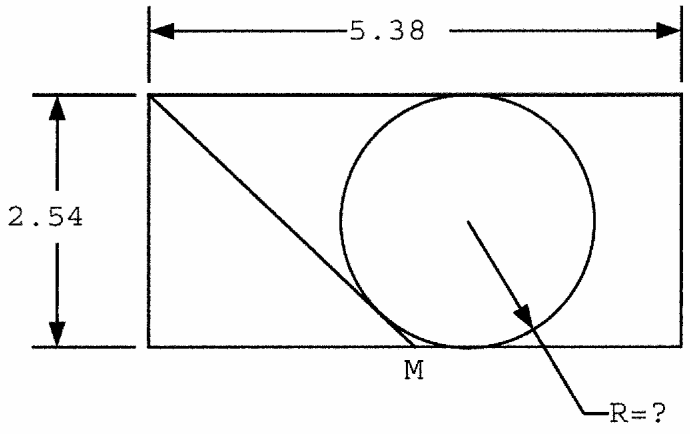
08G-66. What is the product of the slopes of two non-parallel lines passing through the origin that are tangent to the circle $(x+15)^2 + (y-9)^2 = 23.7$? ---------- 66=_____

08G-67. Sam wants to drive the speed limit but when he gets to talking, his speed creeps up. If he starts at 30 mph and his speed creeps steadily up to 45 mph in 45 seconds, how much distance does he cover in those 45 seconds? ---------- 67=_____ ft

08G-68. A clock face reads exactly 8:47. How long will it take the minute hand to align with the hour hand? ---------- 68=_____ min

08G-69.

RECTANGLE AND CIRCLE

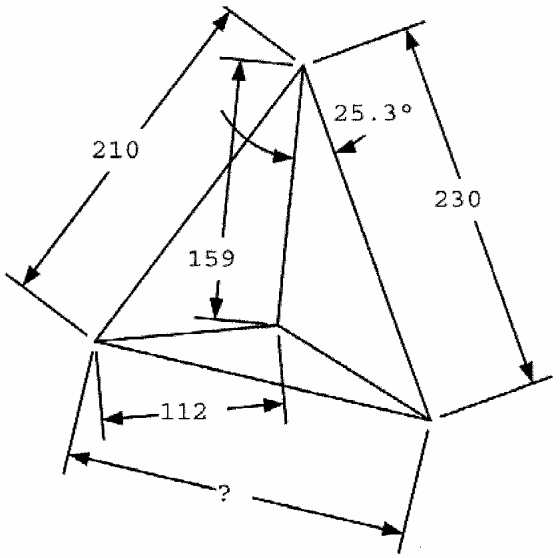


M = MIDPOINT, END OF SLANT LINE

08G-69 = _____

08G-70.

SCALENE TRIANGLES



08G-70 = _____

08G-1 = 7720
= 7.72×10^{3}

08G-2 = -1.32
= -1.32×10^{0}

08G-3 = -0.260
= -2.60×10^{-1}

08G-4 = 767
= 7.67×10^{2}

08G-5 = 0.000321
= 3.21×10^{-4}

08G-6 = 2.74×10^{-6}

08G-7 = 8.71
= 8.71×10^{0}

08G-8 = 7 integer

08G-9 = 5.83
= 5.83×10^{0}

08G-10 = 171
= 1.71×10^{2}

08G-11 = -2.00
= -2.00×10^{0}

08G-12 = -2.86×10^{-6}

08G-13 = 3.45×10^{-5}

08G-14 = -0.000321
= -3.21×10^{-4}

08G-15 = -4.62×10^{-7}

08G-16 = -6.79
= -6.79×10^{0}

08G-17 = 122
= 1.22×10^{2}

08G-18 = 227
= 2.27×10^{2}

08G-19 = 60.7
= 6.07×10^{1}

08G-20 = 177
= 1.77×10^{2}

08G-21 = 0.284
= 2.84×10^{-1}

08G-22 = 0.00869
= 8.69×10^{-3}

08G-23 = 1.96×10^{7}

08G-24 = 1.68
= 1.68×10^{0}

08G-25 = -96.7
= -9.67×10^{1}

08G-26 = 42 (2SD)
= 4.2×10^{1}

08G-27 = 176
= 1.76×10^{2}

08G-28 = 59.8
= 5.98×10^{1}

08G-29 = 5.38
= 5.38×10^{0}

08G-30 = 409
= 4.09×10^{2}

08G-31 = 0.0592
= 5.92×10^{-2}

08G-32 = 223
= 2.23×10^{2}

08G-33 = 140
= 1.40×10^{2}

08G-34 = 6.05×10^{-10}

08G-35 = -38.0
= -3.80×10^{1}

08G-36 = 10.2
= 1.02×10^{1}

08G-37 = 89.9
= 8.99×10^{1}

08G-38 = 0.867
= 8.67×10^{-1}

08G-39 = 5.48
= 5.48×10^{0}

08G-40 = 84.8
= 8.48×10^{1}

08G-41 = 0.0172
= 1.72×10^{-2}

08G-42 = 31.5
= 3.15×10^{1}

08G-43 = -0.345
= -3.45×10^{-1}

08G-44 = 0.758
= 7.58×10^{-1}

08G-45 = -0.652
= -6.52×10^{-1}

08G-46 = $1,222.82

08G-47 = 198,000
= 1.98×10^{5}

08G-48 = -2.45
= -2.45×10^{0}

08G-49 = 180
= 1.80×10^{2}

08G-50 = 0.522
= 5.22×10^{-1}

08G-51 = 0.00799
= 7.99×10^{-3}

08G-52 = -1020
= -1.02×10^{3}

08G-53 = 0.0367
= 3.67×10^{-2}

08G-54 = -1.94×10^{-5}

08G-55 = 2.45
= 2.45×10^{0}

08G-56 = 14.8
= 1.48×10^{1}

08G-57 = 4.00
= 4.00×10^{0}

08G-58 = -85,000
= -8.50×10^{4}

08G-59 = 0.941
= 9.41×10^{-1}

08G-60 = 0.733
= 7.33×10^{-1}

08G-61 = 5.39×10^{8}

08G-62 = 153
= 1.53×10^{2}

08G-63 = 0.000265
= 2.65×10^{-4}

08G-64 = 2.21
= 2.21×10^{0}

08G-65 = -6.79
= -6.79×10^{0}

08G-66 = 0.285
= 2.85×10^{-1}

08G-67 = 2480
= 2.48×10^{3}

08G-68 = 62.1
= 6.21×10^{1}

08G-69 = 1.27
= 1.27×10^{0}

08G-70 = 211
= 2.11×10^{2}