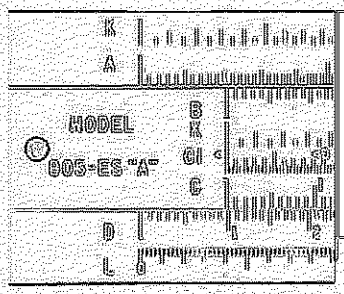

Texas Competitive Mathematics
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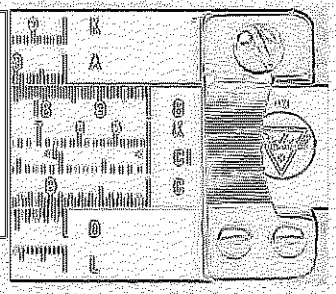
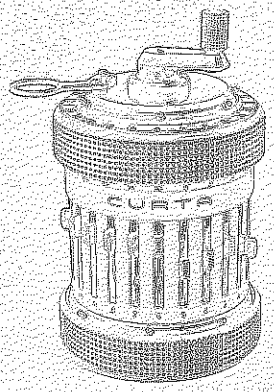
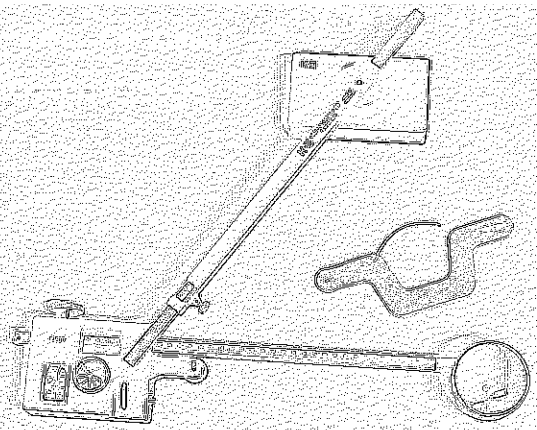
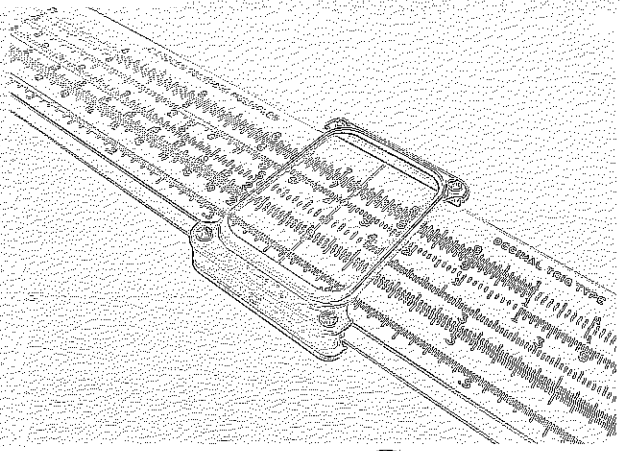
Fax - (866) 606-3535
E-Mail - webmaster@texasmath.org

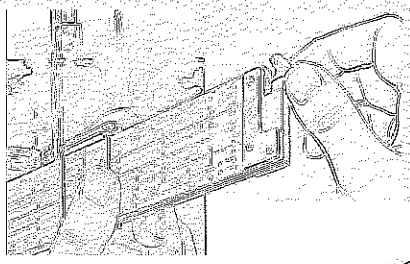


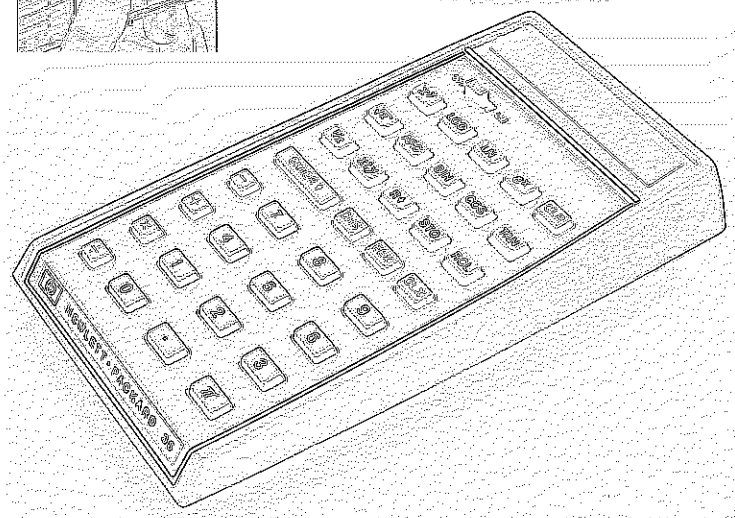
2008 UIL Calculator Appl District 1 (11 pages)

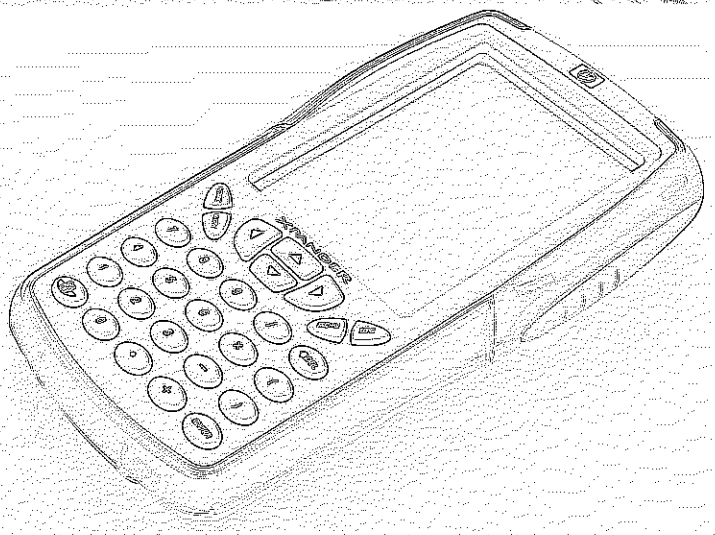


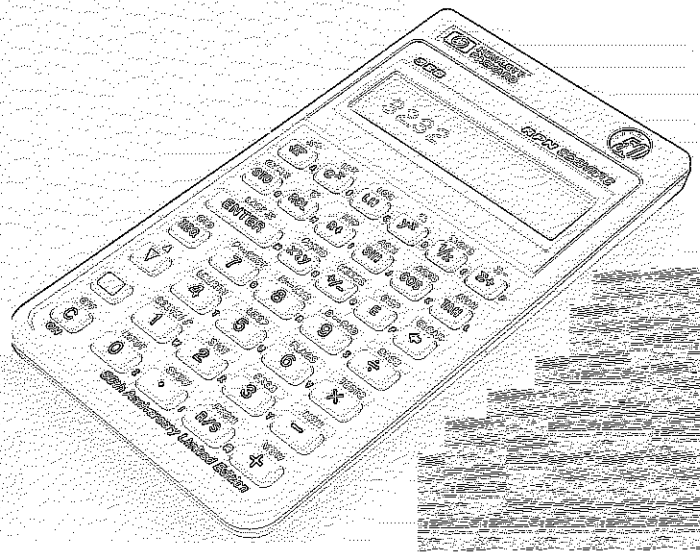


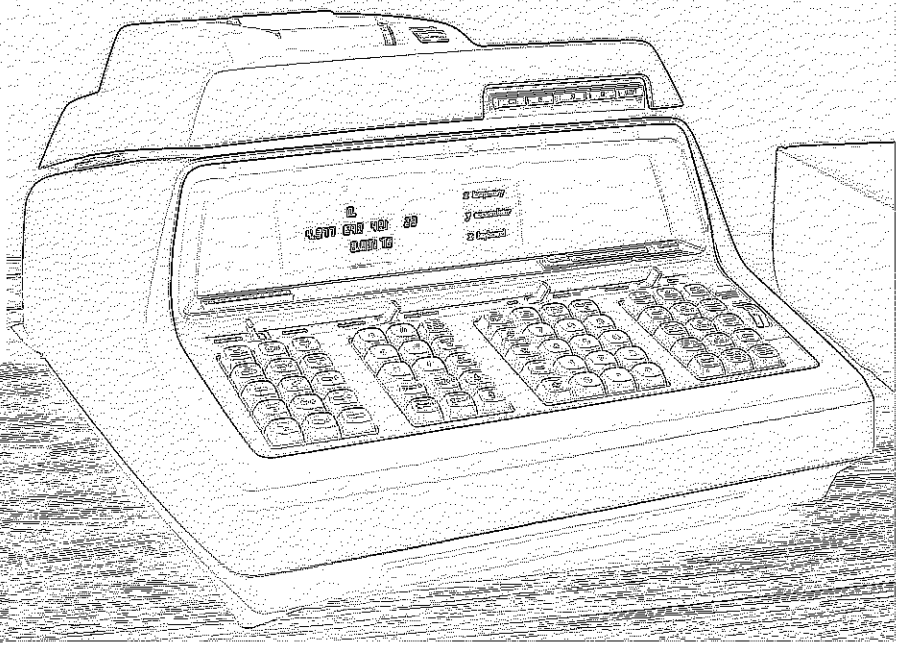












Name _____

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 08F

(District Week 1)

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*, $1.23\text{x}10^{0}$*, $1.23\text{x}10^{1}$, $1.23\text{x}10^{01}$, .0190, 0.0190, $1.90\text{x}10^{-2}$

Incorrect: 12.30, 123.0, $1.23(10)^{2}$, $1.23\cdot10^{2}$, $1.230\text{x}10^{2}$, $1.23*10^{2}$, 0.19, $1.9\text{x}10^{-2}$, $19.0\text{x}10^{-3}$, 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}.

08F-1. $(\pi + 12.2) \times 6.72$ ---------- 1=_____

08F-2. $31.1/77.3 + 0.274 - 0.403$ ---------- 2=_____

08F-3. $(2.18 - 0.378 - 0.985 + 0.138) \times (9.1)$ ---------- 3=_____

08F-4. $\dfrac{(1020 - 727)}{\{(-17.3)/(19.5)\}} + (239 - 27.1)$ ---------- 4=_____

08F-5. $\dfrac{\{(9.47 - 8.37 + 29)/(\pi)\}}{\{(-5.37)(-3.73)/(-9.85)\}}$ ---------- 5=_____

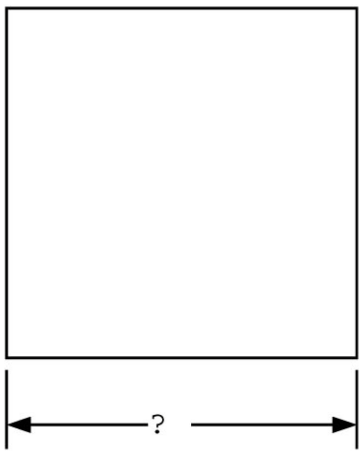
08F-6. How many times can 9850 be divided by 7.3 with a positive remainder? ---------- 6=_____ integer

08F-7. What is the ratio of the light gathering area of a 50 mm diameter monocular lens and the pupil of a human eye, 3.5 mm in diameter? ---------- 7=_____

08F-8. A ball recovers 91% of its height when it bounces. If it were dropped from a height of 30 inches, after what minimum number of bounces is the height less than 6 in? ------ 8=_____ integer

08F-9.

SQUARE

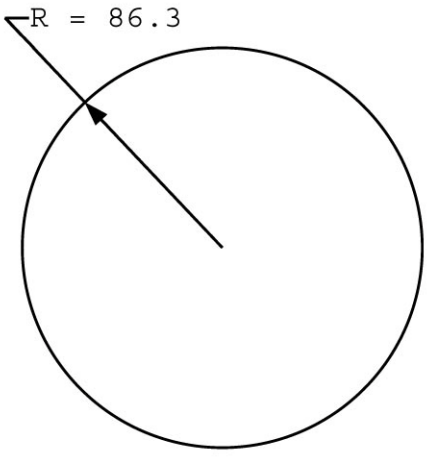


AREA = 0.0936

08F-9 = _____

08F-10.

CIRCLE



AREA = ?

08F-10 = _____

08F-11. $\dfrac{(2.79)(10) + (-7.79)(-9.3)}{-2.59 + 0.957 - (-2.19)(0.821)}$ ---------- 11=_____

08F-12. $\dfrac{-0.00513 + 0.00354}{(0.849)(1.73)(-4.23\text{x}10^{-9})} + (101 + 215)(853 - 148)$ ---------- 12=_____

08F-13. $\dfrac{(-40.5)(528 - 211)\{4470 - (-49.4)(-31)\}}{(-37.2 + 6.81)(-86.3 - 767)}$ ---------- 13=_____

08F-14. $\dfrac{117 + 108 - 134}{(0.986)(-2.71)} - \dfrac{(-39000)(1.10\text{x}10^{-4} + 1.02\text{x}10^{-4})}{0.596 + 0.179 - 0.402}$ ---------- 14=_____

08F-15. $\dfrac{4.24\text{x}10^{5} + 5.89\text{x}10^{5} - (62700 + 1.79\text{x}10^{5})(3.22 - 1.37)}{(-950)(7.31)(6.62)(641 - 1040 + 1060)}$ -------- 15=_____

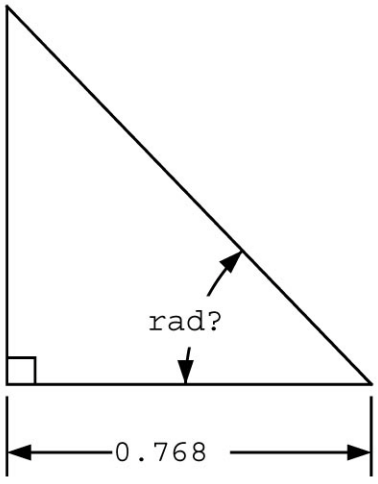
08F-16. Lana invests an amount x for 10 years at an average annual interest rate of 5.5%. If she yields $50,000 principal and interest at the end, what is x? -------- 16=$_____

08F-17. If there are 1,017,018 species of insects in the world and the land area of the earth is 148,939,100 km^2, how many different species are on average in Nacogdoches, Texas with a land area of 25.23 mi^2? ---------- 17=_____ (SD)

08F-18. Texas lies roughly at 30 degrees north latitude. What is the width of the Central Standard Time zone here, assuming that it represents 1/24th of the circumference of the earth at this latitude? ---------- 18=_____ mi

08F-19.

RIGHT TRIANGLE

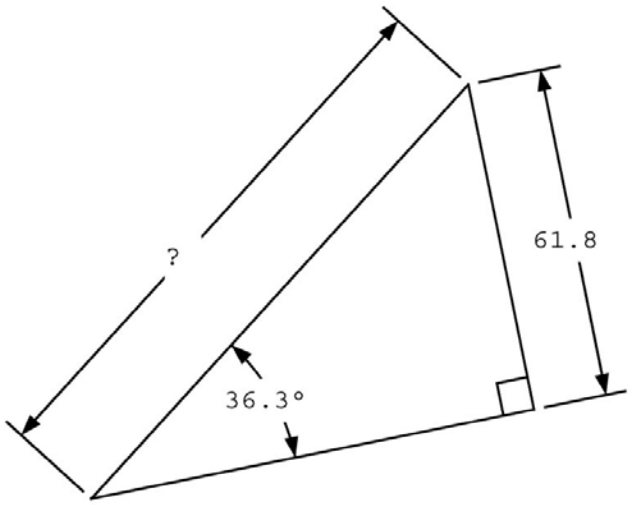


AREA = 0.306

08F-19 = _____

08F-20.

RIGHT TRIANGLE



08F-20 = _____

08F-21. $\left[\frac{\sqrt{1.45 - 0.301}}{8.06} + \frac{(0.626)}{4.98}\right]^2$ ---------- 21=_____

08F-22. $\left[\frac{(0.157)(0.132)}{9.87} + 3.69\text{x}10^{-4}\right]^2 + \sqrt{1.61\text{x}10^{-11}}$ ---------- 22=_____

08F-23. $\left[\frac{1.43 + 1.28 + \sqrt{0.697/0.44}}{-86.6 + 50.8}\right]^2$ ---------- 23=_____

08F-24. $\frac{\sqrt{7.67 + 3.49 + (15.5)/(\pi)}}{-0.83 + 0.12}$ ---------- 24=_____

08F-25. $(0.794)(1.15)\sqrt{(-0.316)^2/0.417} + 1/\sqrt{3.39 + 6.67}$ ---------- 25=_____

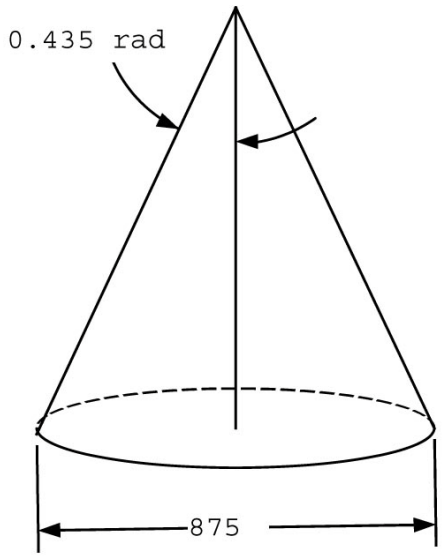
08F-26. Josh completes a job in 4 hr, but Jane can do it in 3.3 hr. What is the percent difference in the total time to complete the job if Josh does it alone, and if Jane joins Josh after 2 hr? ---------- 26=_____ %

08F-27. A pane of glass is 24 in x 36 in x 0.125 in thick. It is shattered into square pieces 0.25 in on a side. What is the percent increase in total surface area of glass? ------ 27=_____ %

08F-28. AOL reported 24 million US subscribers in 2001, a doubling over the previous 2.5 years. Based on this exponential growth rate, how many subscribers are there in 2008, 7 years later? ---------- 28=_____

08F-29.

CONE

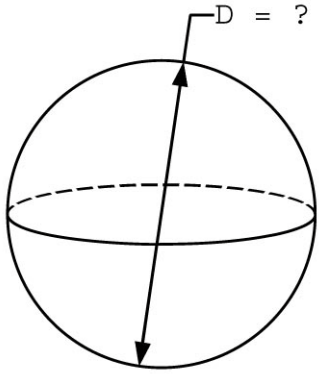


VOLUME = ?

08F-29 = _____

08F-30.

SPHERE



SURFACE AREA = 0.0395

08F-30 = _____

08F-31. $\sqrt{\dfrac{4.19}{\sqrt{72.4 + 7.43}}} \times \left[\dfrac{1}{(3.43 - 2.78)^2} + \dfrac{1}{(1.67 + 0.609)^2}\right]$ --------- 31=_____

08F-32. $\left[\dfrac{-87.4}{-28.5 + 18.3} + 24.3\right] \times \left\{2810 + (-55.9)^2 - \sqrt{1.81\text{x}10^7}\right\}$ ------- 32=_____

08F-33. $\dfrac{\sqrt{(39)/\left\{(1.3)/\sqrt{54.9}\right\}}}{9.16 + (0.518)(2.61)} + \{0.511 + 1.71\}^{1/2}$ ---------- 33=_____

08F-34. $\dfrac{(7.82\text{x}10^5)^2(3.24\text{x}10^{-13} + 1.21\text{x}10^{-13})}{0.178 + (-0.691)(-0.427)} + \dfrac{1}{\dfrac{1}{0.339} + \dfrac{1}{(-0.468)}}$ ----- 34=_____

08F-35. $\dfrac{\dfrac{1}{-0.536} + \dfrac{-2.00\text{x}10^5}{(206 + 165)^2} - \dfrac{\sqrt{3.21\text{x}10^{20}}}{(-1.11\text{x}10^5)^2}}{(-4.23\text{x}10^5 + 6.45\text{x}10^5)^2 + (-5.51\text{x}10^{10})}$ ---------- 35=_____

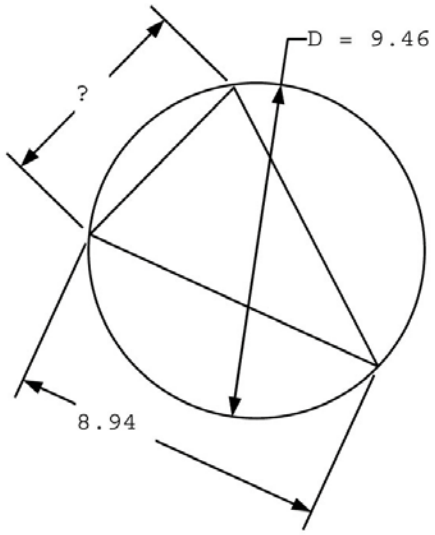
08F-36. What is $53{,}197^{-93{,}461}$? ---------- 36=_____

08F-37. Marie starts a project at a rate to finish in 5 hr. After 2 hr, her rate decelerates such that she finishes 6.3 hr after starting. What was the deceleration rate, a negative number? ---------- 37=_____ proj/hr^2

08F-38. A non-stop flight leaves Tokyo, Japan at 11:30 AM (Japan time) and arrives in Dallas at 9:05 AM (Dallas time) the same day (!). Dallas is 9 time zones later than Tokyo, but you have to subtract one day since the International Date Line was crossed. If the distance between cities is 6461 mi, what is the plane's average ground speed? ---------- 38=_____ mph

08F-39.

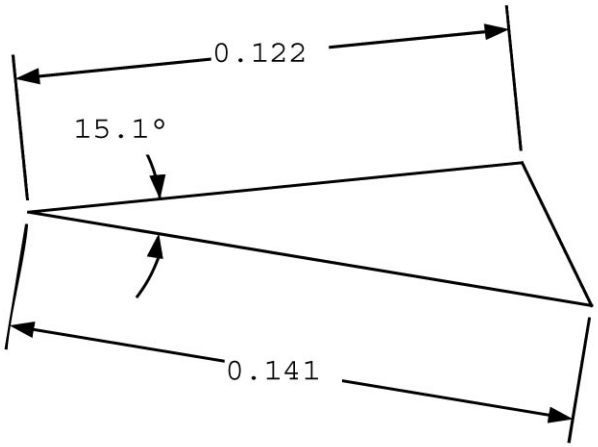
ISOSCELES TRIANGLE AND CIRCLE



08F-39 = _____

08F-40.

SCALENE TRIANGLE



PERIMETER = ?

08F-40 = _____

08F-41. $\dfrac{10^{-(\pi - 6.86)}}{8.98\text{x}10^{-4} + 5.62\text{x}10^{-4}}$ ---------- 41=_____

08F-42. $\dfrac{e^{+0.441} + e^{-0.38}}{(-1.94 + 3.6)}$ ---------- 42=_____

08F-43. $(-499)\text{Log}\{(318)(0.464 + 1/0.775)\}$ ---------- 43=_____

08F-44. $(161 + 225)^{1/3} + 1/\{(131)^{-0.451}\}$ ---------- 44=_____

08F-45.(deg) $\{(19700)\sin(-167°)\} \text{ x } \{(-36900)\cos(-72.4°)\}$ ---------- 45=_____

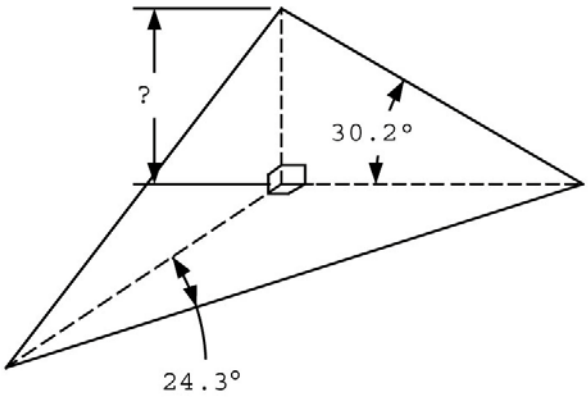
08F-46. The old city wall of York, England forms a square 3 miles in perimeter. If a 4 meter by 4 meter scaled model of the old city were constructed, how tall on the model would a 10 meter tall building be? ---------- 46=_____ in

08F-47. Paula collected rocks for a project. She intended to collect a set of rocks increasing in size by 1 in increments. Her actual rocks measured 0.95 in, 1.92 in, 3.2 in, 4.15 in and 4.9 in. What is the best-fit rock size estimate for her attempt to find a 7 in rock? ------ 47=_____ in

08F-48. What is p if p>5 and $3(p-7)^6+3^p = (400-p)+7(p+10)$? ---- 48=_____

08F-49.

CORNER OF A CUBE

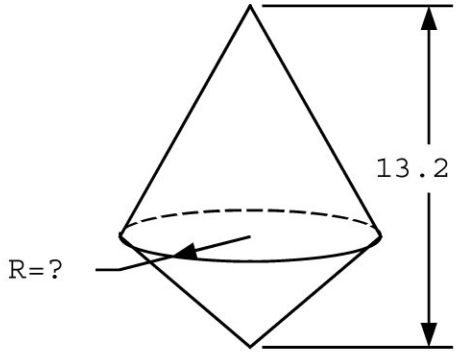


VOLUME = 123

08F-49 = _____

08F-50.

CONES



TOTAL VOLUME = 352

08F-50 = _____

08F-51. $\dfrac{(567)\ 10^{-(4.19\ -\ 1.61)}}{13.1 + 3.45}$ ---------- 51=_____

08F-52. $\dfrac{4.95 + e^{(1.2\ +\ \pi)}}{0.205 - e^{-(0.392\ -\ 0.703)}}$ ---------- 52=_____

08F-53. $\dfrac{(-56.1)\ \mathrm{Log}(-86.6 + 362)}{\mathrm{Log}(0.929) - (0.544)(0.397)}$ ---------- 53=_____

08F-54. $\dfrac{1}{(0.247)^{(-0.795)}} + (0.88 + 0.737)^{(0.659\ -\ 0.276)}$ ---------- 54=_____

08F-55.(rad) $\arctan\left[\dfrac{(1660)(0.443)}{(1.87)(53.9)}\right] + (0.751)(9.32)$ ---------- 55=_____

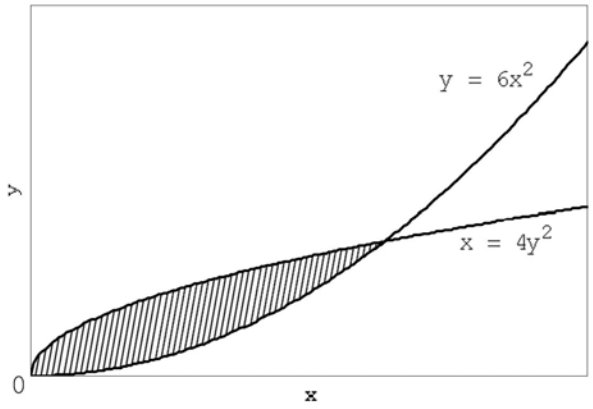
08F-56. At what value of x does the slope (dy/dx) equal -3 for $xy^2 - 5 = 0$? ---------- 56=_____

08F-57. A right triangle with hypotenuse equal to 3 inches is rotated about a leg to produce a cone. What is the maximum volume of the cone? ---------- 57=_____ in^3

08F-58. What is Det[[**C**][**E**]] if [**C**] = $\begin{bmatrix} 6 & -7 \\ -1 & 6 \end{bmatrix}$ and [**E**] = $\begin{bmatrix} -3 & 7 \\ 9 & 7 \end{bmatrix}$? 58=_____

08F-59.

SOLID OF REVOLUTION
(Axis of Revolution: y = -3)

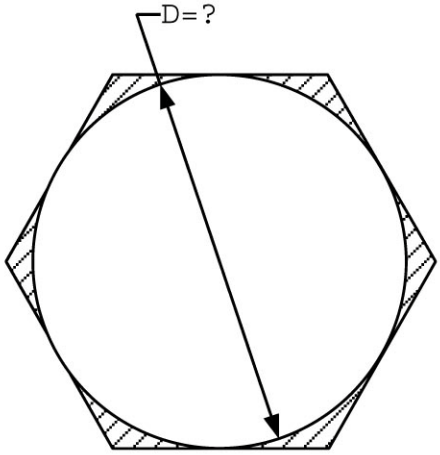


VOLUME = ?

08F-59 = _____

08F-60.

REGULAR HEXAGON AND CIRCLE



HATCHED AREA = 6280

08F-60 = _____

08F-61. $\mathrm{Ln}\left[\dfrac{(1.39)^2 - 2(1.39)(2.18) + (2.18)^2}{(4.75)^2}\right]^2$ ---------- 61=_____

08F-62. $(24.6)10^{\mathrm{Log}[(2.76)(0.476)]} + \{(2750)(0.926)\}^{1/2}$ ---------- 62=_____

08F-63. (deg) $\sin(-85.3°)\cos(97.4°) + \cos(-85.3°)\sin(97.4°)$ ---------- 63=_____

08F-64. $1 + \dfrac{(0.629)^4}{2} - \dfrac{(0.629)^6}{6} + \dfrac{(0.629)^8}{24} - \dfrac{(0.629)^{10}}{120}$ ---------- 64=_____

08F-65. $\dfrac{(-59.4)}{(2.56)} - \dfrac{(9.34)}{(-1.85)^2}\,\mathrm{Ln}\left[\dfrac{(-0.0477)^2 + (4.58\text{x}10^{-4})}{(8.22) + \sqrt{102}}\right]$ ---------- 65=_____

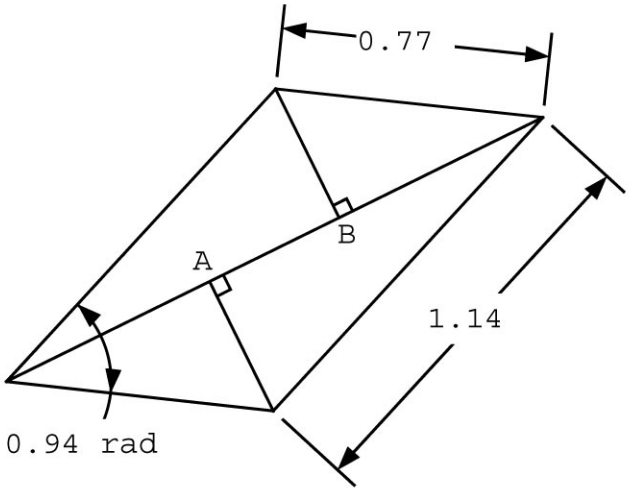
08F-66. A runner accelerates at 8 ft/s^2 from rest to a final velocity over a distance of 11 ft. How long does it take for him to run 1.5 mi at the final velocity? ---------- 66=_____ min

08F-67. On a Texas ranch, a pond is 150 ft in diameter and the land slopes at 4.8° (from horizontal) away from the pond. What is the pond diameter after a 4 in rain if 50% of the rain runs into the pond, and the rain gathering area is 3.8 acres? ---------- 67=_____ ft

08F-68. A shepherd shears two sheep to get exactly enough wool to clothe his two children, who are 5 and 8 years old. Six years later he has children that are 5, 11, and 14 years old. Assuming heights increase as (age)$^{0.8}$, how many sheep does he now need to shear to provide clothing for his children? ---------- 68=_____ integer

08F-69.

PARALLELOGRAM

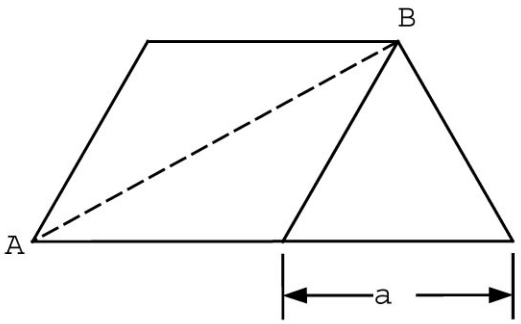


AB = ?

08F-69 = _____

08F-70.

PARALLELOGRAM AND EQUILATERAL TRIANGLE



AREA(PARALLELOGRAM) = 2.2 AREA(TRIANGLE)

AB/a = ?

08F-70 = _____

08F-1 = 103
= 1.03×10^{2}

08F-2 = 0.273
= 2.73×10^{-1}

08F-3 = 8.69
= 8.69×10^{0}

08F-4 = -118
= -1.18×10^{2}

08F-5 = -4.71
= -4.71×10^{0}

08F-6 = 1349 integer

08F-7 = 204
= 2.04×10^{2}

08F-8 = 18 integer

08F-9 = 0.306
= 3.06×10^{-1}

08F-10 = 23400
= 2.34×10^{4}

08F-11 = 608
= 6.08×10^{2}

08F-12 = 479000
= 4.79×10^{5}

08F-13 = -1450
= -1.45×10^{3}

08F-14 = -11.9
= -1.19×10^{1}

08F-15 = -0.0186
= -1.86×10^{-2}

08F-16 = $29,271.53

08F-17 = 0.4462
= 4.462×10^{-1} (4SD)

08F-18 = 898
= 8.98×10^{2}

08F-19 = 0.804
= 8.04×10^{-1}

08F-20 = 104
= 1.04×10^{2}

08F-21 = 0.0669
= 6.69×10^{-2}

08F-22 = 1.01×10^{-5}

08F-23 = 0.0123
= 1.23×10^{-2}

08F-24 = -5.65
= -5.65×10^{0}

08F-25 = 0.762
= 7.62×10^{-1}

08F-26 = -27.4
= -2.74×10^{1}

08F-27 = 98.3
= 9.83×10^{1}

08F-28 = 1.67×10^{8}

08F-29 = 1.89×10^{8}

08F-30 = 0.112
= 1.12×10^{-1}

08F-31 = 1.75
= 1.75×10^{0}

08F-32 = 55200
= 5.52×10^{4}

08F-33 = 2.91
= 2.91×10^{0}

08F-34 = 1.81
= 1.81×10^{0}

08F-35 = 8.21×10^{-10}

08F-36 = $7.28 \times 10^{-441,687}$

08F-37 = -0.0281
= -2.81×10^{-2}

08F-38 = 513
= 5.13×10^{2}

08F-39 = 5.85
= 5.85×10^{0}

08F-40 = 0.302
= 3.02×10^{-1}

08F-41 = 3.58×10^{6}

08F-42 = 1.35
= 1.35×10^{0}

08F-43 = -1370
= -1.37×10^{3}

08F-44 = 16.3
= 1.63×10^{1}

08F-45 = 4.94×10^{7}

08F-46 = 1.30
= 1.30×10^{0}

08F-47 = 7.08
= 7.08×10^{0}

08F-48 = 5.63
= 5.63×10^{0}

08F-49 = 4.83
= 4.83×10^{0}

08F-50 = 5.05
= 5.05×10^{0}

08F-51 = 0.0901
= 9.01×10^{-2} 08F-6

08F-52 = -70.5
= -7.05×10^{1} 08F-6

08F-53 = 552
= 5.52×10^{2} 08F-6

08F-54 = 1.53
= 1.53×10^{0} 08F-6

08F-55 = 8.43
= 8.43×10^{0} 08F-6

08F-56 = 0.518
= 5.18×10^{-1} 08F-6

08F-57 = 10.9
= 1.09×10^{1} 08F-6

08F-58 = -2440
= -2.44×10^{3} 08F-6

08F-59 = 0.270
= 2.70×10^{-1} 08F-7

08F-60 = 279
= 2.79×10^{2}