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 25H

(Region)

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}.

25H-1. $(-25.1 - 16.1)/(-80.5)$ ---------- 1=_____

25H-2. $0.853/0.698 + 1.16 - 1.22$ ---------- 2=_____

25H-3. $(\pi - 1.51 + 4.75 + 0.831)/(1.16)$ ---------- 3=_____

25H-4. $\dfrac{(0.562)(0.667 - 0.427 + 0.992)}{(0.107)(0.421)}$ ---------- 4=_____

25H-5. $7.50 \times 10^6 + 3.63 \times 10^6 - 5.05 \times 10^6 + \dfrac{(-30800 + 20900)}{(-0.021)(0.0644)}$ ---------- 5=_____

25H-6. Solve for the product of 411 and 46.4. ---------- 6=_____

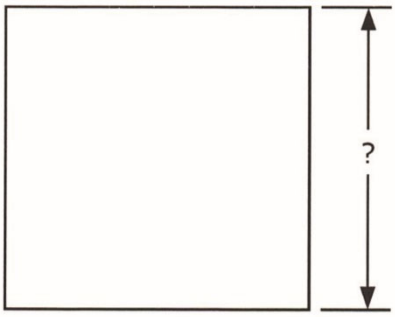
25H-7. Calculate x if x raised to the power 2.42 equals 8.45. ---------- 7=_____

25H-8. What is the integer part of the result of multiplying 144 and 8.48? --- 8=_____integer

25H-9.

SQUARE

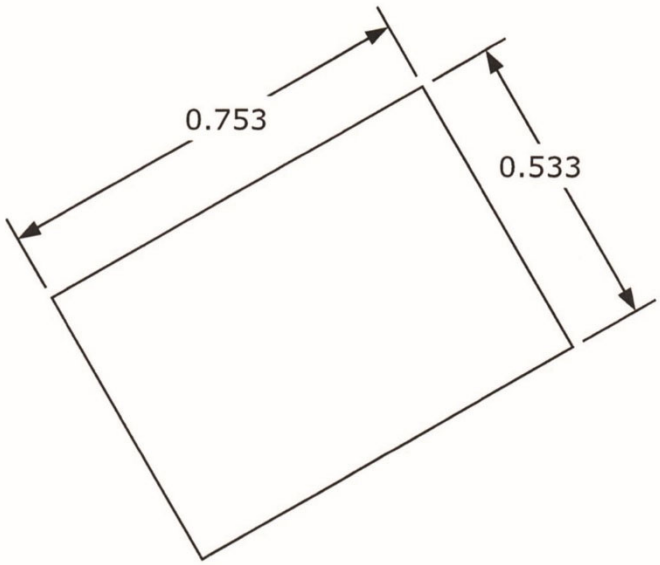
Area = 80.6



25H-9 =_____

25H-10.

RECTANGLE



Perimeter = ?

25H-10 =_____

25H-11. $\dfrac{(-258 + 75.3)(679 - 597 + 2420)}{(-844)(-186) - 7.31\text{x}10^{5}}$ ---------- 11=_____

25H-12. $\dfrac{1.34(4.53\text{x}10^{-5} + 3.07\text{x}10^{-5})}{(120 - 541)(\pi)} - \dfrac{1.31\text{x}10^{-9}}{0.759 - 0.506}$ ---------- 12=_____

25H-13. $\dfrac{\{(-0.887 + 0.757)(67 + 74) + (-30.2)\}(615)}{(-736)(-710 + 3600)(260)}$ ---------- 13=_____

25H-14. $\dfrac{\{(0.114 + 0.235)(1.67 + 11.1) + 29.5 - 5.73\}}{(-654 - 587)(88.4 + 172 - 153)}$ ---------- 14=_____

25H-15. $\dfrac{(71100 + 29400 - 1.03\text{x}10^{5})(0.293 - 0.139 - 0.187)}{(176)(-229)(-782)(8.85 + 3.94 + 7.44)}$ ---------- 15=_____

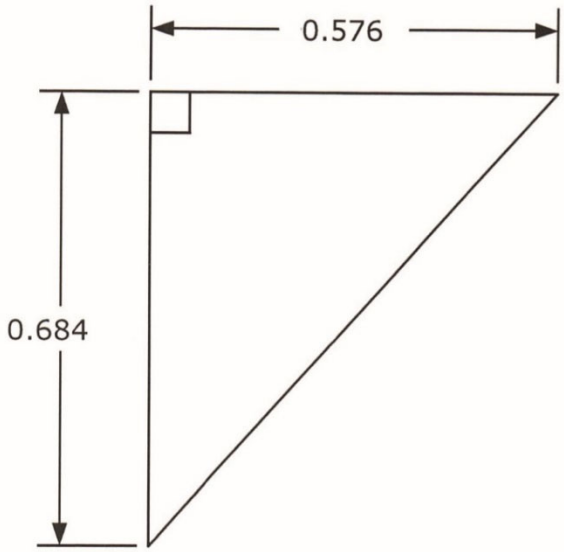
25H-16. A fish tank light is set to come on at 9:30 AM and to switch off at 8:45 PM. How long is the light on daily? ---------- 16=_____hr

25H-17. The 2024 Superbowl was tuned in by 123 million people. What fraction of the total US population, 333 million, tuned in? ---------- 17=_____%

25H-18. There are 54 Oreo cookies in a package. Liam wants to provide the entire 345-person ninth grade with individually wrapped baggies, each containing four cookies. How many packages must he purchase? ---------- 18=_____integer

25H-19.

RIGHT TRIANGLE

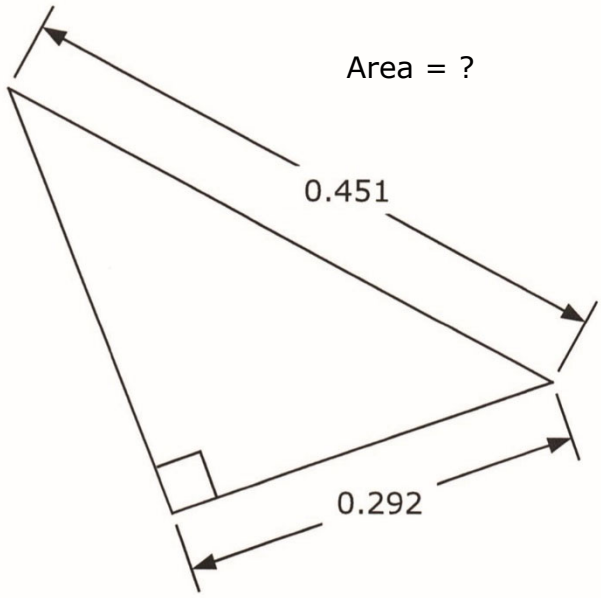


Perimeter = ?

25H-19 =_____

25H-20.

RIGHT TRIANGLE



25H-20 =_____

25H-21. $\frac{1}{5.53 + 25.5} + \frac{1}{25.8 - 43.4} + \frac{1}{(18.5)}$ ---------- 21=_____

25H-22. $\frac{-0.0929 + 1/(-2.39)}{1/(0.419) + 4.16} + \frac{1}{(-2.42)}$ ---------- 22=_____

25H-23. $(493)(2.38\text{x}10^{-4})\sqrt{(-0.122)^2/0.188} + 1/\sqrt{278 + 561}$ ---------- 23=_____

25H-24. $\left[-32.4 + \sqrt{172}\right]^2 \text{ x } [191 + 241]^2 \text{ x } \sqrt{0.0672/0.0738}$ ---------- 24=_____

25H-25. $(145)(0.0487) + \sqrt{(46.7)/(4.61)} + [(0.315)(6.25)]^2$ ---------- 25=_____

25H-26. The Mona Lisa painting is 77 cm by 53 cm. How many 8.5 in by 11 in letter-sized sheets are needed to just cover the painted side? Sheets may be cut to fit. ---------- 26=_____ integer

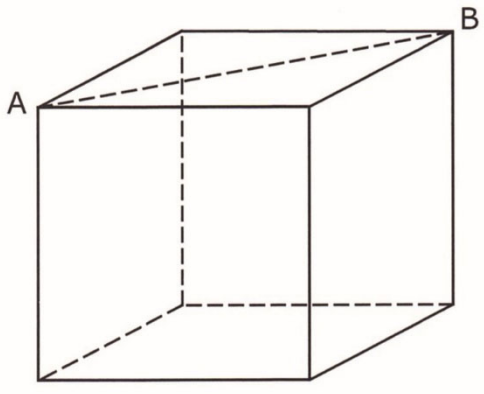
25H-27. Mr. Jenson wants to buy a bulletin board for his classroom. A 4 ft by 8 ft cork board costs $268.99. A set of generic postings costs $23.99. The border runs $4.99, and push pins cost $4.39. How much does Mr. Jenson owe if the school covers two thirds of the cost? ---------- 27=$_____

25H-28. Ms. Hardy has a bunch of 5-page student English essays to read. She starts reading at one page every 1 min 37 s. What is the percent decrease in time to read one essay, if, after a while, her reading speed improves to 1 min 14 s? ---------- 28=_____ %

25H-29.

CUBE

Volume = 6.34

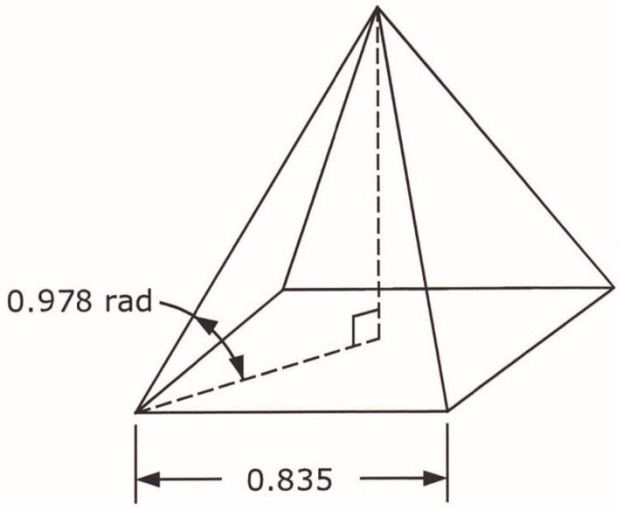


AB = ?

25H-29 =_____

25H-30.

SQUARE PYRAMID



Volume = ?

25H-30 =_____

25H-31. $\sqrt{\dfrac{1/(208 - 98.1)}{(322)(1.24 + 0.403)^2}} + (-3.54\text{x}10^{-4})^2(21200)$ ---------- 31=_____

25H-32. $\dfrac{1}{0.00105} + \dfrac{1}{\sqrt{6.62\text{x}10^{-6}}} + \dfrac{(8.82 + 11.6 - 1.85)^2}{\sqrt{2.72 - 1.77}}$ ---------- 32=_____

25H-33. $\dfrac{(4.73)^2 + \sqrt{441}}{\sqrt{(6.51)(-64.5)^2}} + \dfrac{\sqrt{\sqrt{(0.111)(0.521)}}}{-9.47 + 11.7}$ ---------- 33=_____

25H-34. $\dfrac{[43.6/(0.743 + 0.327) + 1/(0.00305)]^{1/2}}{(0.0482 + 0.0618)^2 \text{ x } \sqrt{0.0485 - (0.0451)}}$ ---------- 34=_____

25H-35. $\dfrac{(6170 + 9030)^2 - (9720 - 3120)^2}{\sqrt{(488)(0.516)(896 + 749 - 981)^2}}$ ---------- 35=_____

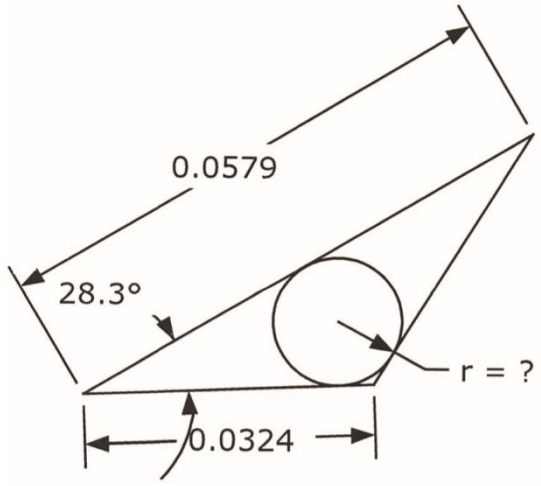
25H-36. Absolute temperature may be measured in Rankine units (R). An oven's temperature drifts. An hour after setting the temperature to 834.7 R, it had drifted to 822.7 R. What is the percent change in temperature? ---------- 36=_____%(SD)

25H-37. A 74-in long piece of string is cut into two segments, and each segment is used to form a circle. Calculate the ratio of circle radii, greater than 1, if the area of both circles totals 250 in^2. ---------- 37=_____

25H-38. The US made the Louisiana Purchase in 1803, paying $15 million for 828,000 mi^2 of land. Given an average annual inflation rate of 2.5%, what would the value of 1 mi^2 of land be worth in 2025 dollars? ---------- 38=$_____

25H-39.

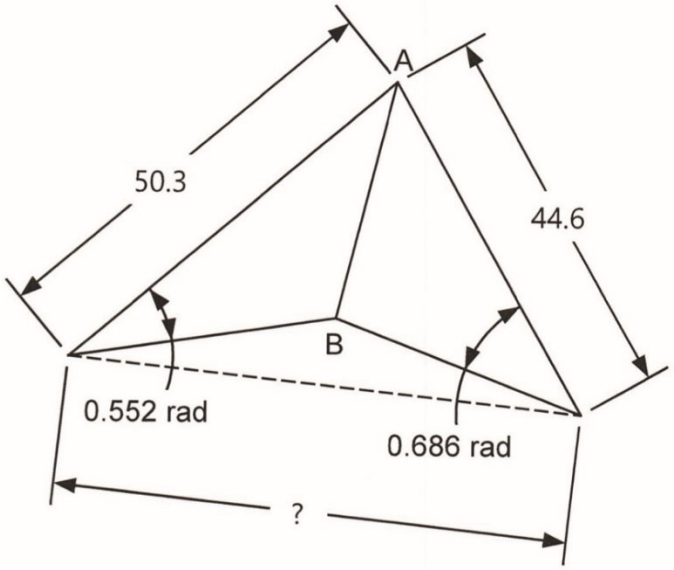
SCALENE TRIANGLE AND CIRCLE



25H-39 =_____

25H-40.

SCALENE TRIANGLES
AB = 28.5



25H-40 =_____

25H-41. $(-2.77)(1.74)10^{\{-8.7/-7.52\}}$ ---------- 41=_____

25H-42. $\frac{(8.37\text{x}10^{-6})}{(6.32\text{x}10^{-6})}\left[1 - e^{-(0.939)(0.157)}\right]$ ---------- 42=_____

25H-43. $\frac{\text{Ln}(30.1 + 35.6 - 18.8)}{(-45.5)}$ ---------- 43=_____

25H-44. $(498 + 900)^{1/3} + 1/\{(456)^{-0.322}\}$ ---------- 44=_____

25H-45.(deg) $\sin\left[90° \text{ x } \frac{(-9.65)}{(10.5)}\right] + \cos\{109° - 65.7°\}$ ---------- 45=_____

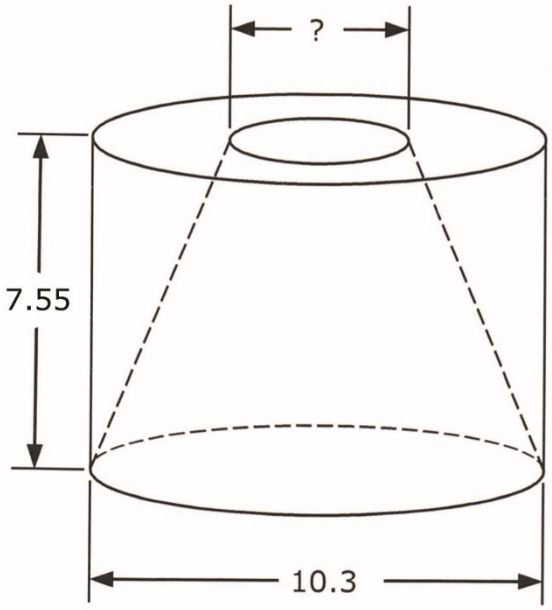
25H-46. The total surface area of 1 kg of 30-μm sized particles is 0.43 m^2.
What is the total surface area of 5 kg of 120-nm sized particles? ---------- 46=_____ m^2

25H-47. Calculate the correlation coefficient of these data: (0,0), (2,3), (4,9), (6,11), (8,18). ---------- 47=_____

25H-48. What is r if $2^r = r^2$, and r is negative? ---------- 48=_____

25H-49.
CYLINDER WITH FRUSTUM CAVITY

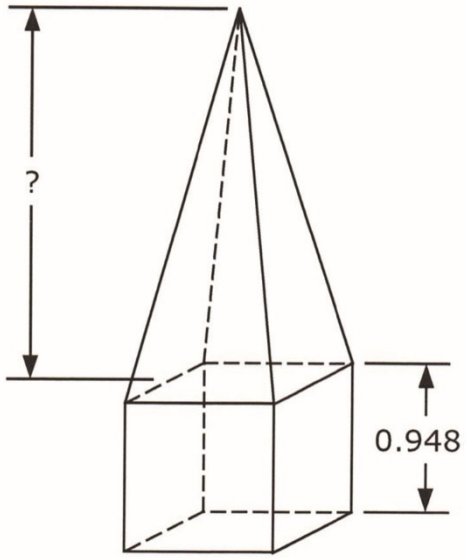
Volume = 302



25H-49 =_____

25H-50.
CUBE AND PYRAMID

Cube Total Surface Area = Pyramid Total Surface Area



25H-50 =_____

25H-51. $\dfrac{(-284)\ 10^{-(7.26\ -\ \pi)}}{146 + 27.6}$ ---------- 51=_____

25H-52. $\dfrac{(-2.65\text{x}10^{-6} - 7.23\text{x}10^{-7})\ e^{(0.977)(4.25)}}{e^{-(3.73\ -\ 1.31)}}$ ---------- 52=_____

25H-53. $\dfrac{(180)\ \text{Log}(-460 + 1870)}{\text{Log}(0.276) - (0.119)(0.949)}$ ---------- 53=_____

25H-54. $\dfrac{(-0.764 + 0.942)^{-0.509}}{(0.841)^{-(0.528\ +\ 0.474)}}$ ---------- 54=_____

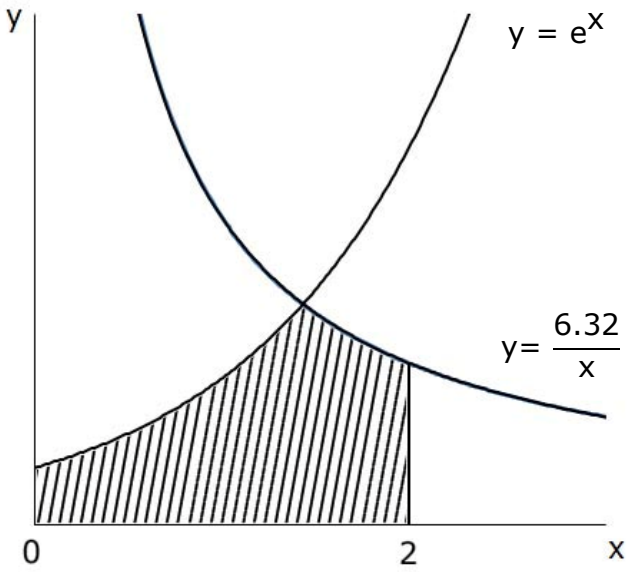
25H-55.(rad) $\dfrac{\arcsin\left\{(-5.70\text{x}10^{-4})(-8.07\text{x}10^{-4})/(5.24\text{x}10^{-7})\right\}}{-5.04\text{x}10^{-7} + (7.54\text{x}10^{-4})(-6.97\text{x}10^{-4})}$ --------- 55=_____

25H-56. What is positive b, if the line y = bx is tangent to the curve $y = 6(x+3)^2+7$? ---------- 56=_____

25H-57. Elias has a cylindrical rain barrel that sits on end with a bottom tap. The water velocity out of the tap drains the barrel at a rate proportional to the water height in the barrel. When initially full, it drains 30% of the water in 12 min. How long does it take to drain another 30%? --- 57=_____ min

25H-58. What is the positive difference in the determinants of $\begin{bmatrix} 75 & 47 \\ -25 & 33 \end{bmatrix}$ and $\begin{bmatrix} 31 & 17 \\ 13 & 6 \end{bmatrix}$? ---------- 58=_____

25H-59.

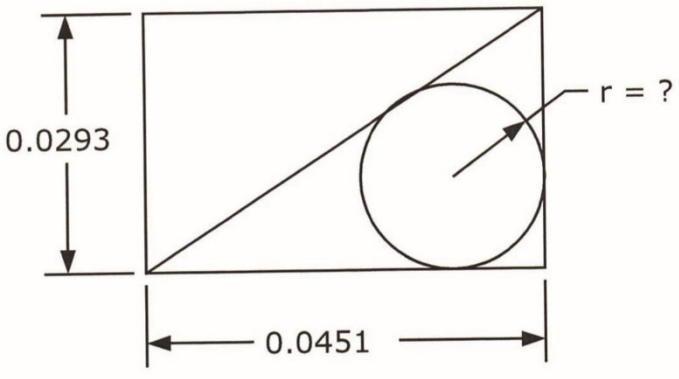


Hatched Area = ?

25H-59 =_____

25H-60.

RECTANGLE AND CIRCLE



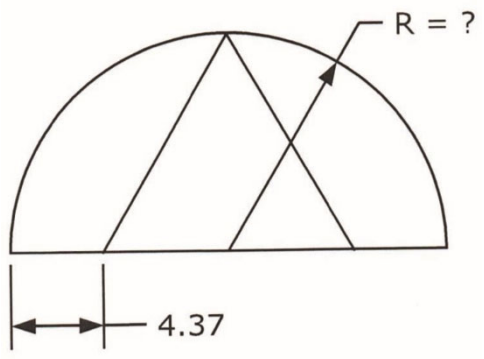
25H-60 =_____

25H-61. How long after 9:15 do the minute and hour hands of a clock align? ---------- 61=_____ min

25H-62. What is $6^{(7^8)}$? ---------- 62=_____

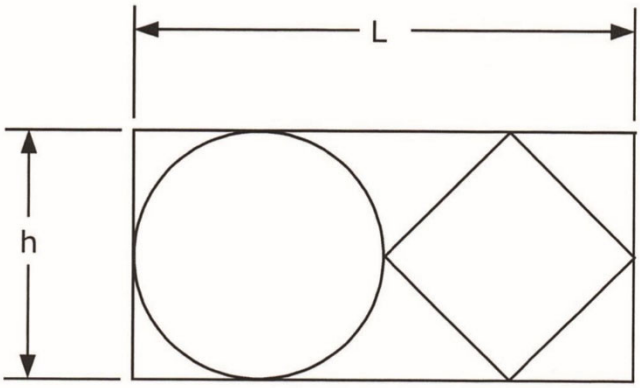
25H-63. A fielder catches a baseball and throws it 175 ft to the shortstop. If the release angle was 40° relative to the horizonal, what was the baseball release velocity? ---------- 63=_____ mph

25H-64.
SEMICIRCLE AND EQUILATERAL TRIANGLE



25H-64 =_____

25H-65.
RECTANGLE, CIRCLE, AND SQUARE



$\frac{L}{h}$ = ?

25H-65 =_____

25H-66. $\text{Ln}\left[\frac{(3.55)(0.989)}{(8.66)}\right]^3 + \text{Ln}\left[\frac{(8.66)}{(8.53)}\right]^3$ ---------- 66=_____

25H-67. (rad) $\cos(0.725 - 0.586) - \cos(0.725 + 0.586)$ ---------- 67=_____

25H-68. (deg) $\left\{\cos^2(85.8°) - \sin^2(85.8°)\right\} \times \frac{\tan(85.8°)}{1 - \tan^2(85.8°)}$ ---------- 68=_____

25H-69. $1 + (0.439) + \frac{(0.439)^2}{2} + \frac{(0.439)^3}{6} + \frac{(0.439)^4}{24}$ ---------- 69=_____

25H-70. $\frac{(0.926)}{(-4.06)} - \frac{(8.23)}{(9.64)^2}\,\text{Ln}\left[\frac{(-0.0513)^2 + (3.43\text{x}10^{-4})}{(6.34) + \sqrt{41.1}}\right]$ ---------- 70=_____

25H-1 = 0.512
= 5.12×10^{-1}

25H-2 = 1.16
= 1.16×10^{0}

25H-3 = 6.22
= 6.22×10^{0}

25H-4 = 15.4
= 1.54×10^{1}

25H-5 = 1.34×10^{7}

25H-6 = 19100
= 1.91×10^{4}

25H-7 = 2.42
= 2.42×10^{0}

25H-8 = 1221 integer

25H-9 = 8.98
= 8.98×10^{0}

25H-10 = 2.57
= 2.57×10^{0}

25H-11 = 0.796
= 7.96×10^{-1}

25H-12 = -8.22×10^{-8}

25H-13 = 5.40×10^{-5}

25H-14 = −0.000212
= -2.12×10^{-4}

25H-15 = 1.29×10^{-7}

25H-16 = 11.3
= 1.13×10^{1}

25H-17 = 36.9
= 3.69×10^{1}

25H-18 = 26 integer

25H-19 = 2.15
= 2.15×10^{0}

25H-20 = 0.0502
= 5.02×10^{-2}

25H-21 = 0.0295
= 2.95×10^{-2}

25H-22 = −0.491
= -4.91×10^{-1}

25H-23 = 0.0675
= 6.75×10^{-2}

25H-24 = 6.62×10^{7}

25H-25 = 14.1
= 1.41×10^{1}

25H-26 = 7 integer

25H-27 = $100.79

25H-28 = 23.7
= 2.37×10^{1}

25H-29 = 2.62
= 2.62×10^{0}

25H-30 = 0.204
= 2.04×10^{-1}

25H-31 = 0.00589
= 5.89×10^{-3}

25H-32 = 1690
= 1.69×10^{3}

25H-33 = 0.483
= 4.83×10^{-1}

25H-34 = 27200
= 2.72×10^{4}

25H-35 = 17800
= 1.78×10^{4}

25H-36 = −1.44
= -1.44×10^{0} (3SD)

25H-37 = 2.25
= 2.25×10^{0}

25H-38 = $4352.70

25H-39 = 0.00720
= 7.20×10^{-3}

25H-40 = 60.7
= 6.07×10^{1}

25H-41 = −69.2
= -6.92×10^{1}

25H-42 = 0.182
= 1.82×10^{-1}

25H-43 = −0.0846
= -8.46×10^{-2}

25H-44 = 18.4
= 1.84×10^{1}

25H-45 = −0.264
= -2.64×10^{-1}

25H-46 = 538
= 5.38×10^{2}

25H-47 = 0.987
= 9.87×10^{-1}

25H-48 = −0.767
= -7.67×10^{-1}

25H-49 = 4.12
= 4.12×10^{0}

25H-50 = 2.32
= 2.32×10^{0}

25H-51 = −0.000125
= -1.25×10^{-4}

25H-52 = −0.00241
= -2.41×10^{-3}

25H-53 = −844
= -8.44×10^{2}

25H-54 = 2.02
= 2.02×10^{0}

25H-55 = -1.04×10^{6}

25H-56 = 74.3
= 7.43×10^{1}

25H-57 = 18.8
= 1.88×10^{1}

25H-58 = 3690
= 3.69×10^{3}

25H-59 = 5.29
= 5.29×10^{0}

25H-60 = 0.0103
= 1.03×10^{-2}

25H-61 = 34.1
= 3.41×10^{1}

25H-62 = $1.28 \times 10^{4,485,887}$

25H-63 = 51.6
= 5.16×10^{1}

25H-64 = 10.3
= 1.03×10^{1}

25H-65 = 2.00
= 2.00×10^{0}

25H-66 = −2.66
= -2.66×10^{0}

25H-67 = 0.733
= 7.33×10^{-1}

25H-68 = 0.0730
= 7.30×10^{-2}

25H-69 = 1.55
= 1.55×10^{0}

25H-70 = 0.513
= 5.13×10^{-1}