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 25I

(State)

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}.

25I-1. $(\pi \times 0.37) + 0.277$ ---------- 1=_____

25I-2. $(-0.303 + 0.0266) \times (0.476) - 0.352$ ---------- 2=_____

25I-3. $(-0.189 + 0.256 - 0.137)/(-0.874) + 0.00818$ ---------- 3=_____

25I-4. $\{(-6.47)(0.989 + 7.91 - 5.47)(-7.4)\} + 83.4$ ---------- 4=_____

25I-5. $\dfrac{19000 + 12800}{(6.15)(-5.37)(-0.315)} + 4380 - 4140$ ---------- 5=_____

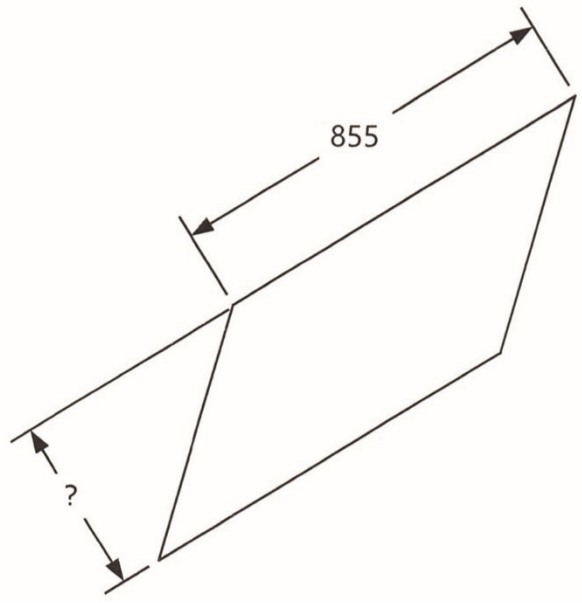
25I-6. Calculate the product of 0.155 and 1840. ---------- 6=_____

25I-7. What is the cube root of –25.5? ---------- 7=_____

25I-8. What is the remainder of 491 divided by 21.3? ---------- 8=_____

25I-9.

PARALLELOGRAM

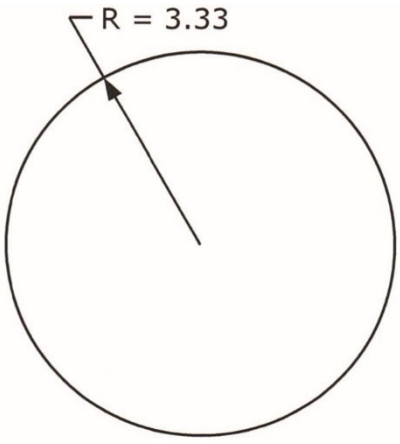


Area = 328,000

25I-9 =_____

25I-10.

CIRCLE



Circumference = ?

25I-10 =_____

25I-11. $\dfrac{(-5.11)(0.857) + (4.16)(-2.41)}{-6.82 + 5.59 - (-7.63)(0.753)}$ ---------- 11=_____

25I-12. $\dfrac{(-27.5)(98.7) - (53.4 + 20)(-43.5)}{(-84.2 + 115 + 52.4)(-39.5)}$ ---------- 12=_____

25I-13. $\dfrac{\{(-0.603 + 0.249)(72 + 352) + (-446)\}(672)}{(937)(615 + 1010)(-858)}$ ---------- 13=_____

25I-14. $\dfrac{-12.5}{-0.606} + \dfrac{376 + 147 - 651}{0.674 - \pi} + \dfrac{(5.57\text{x}10^{-4} + 0.00154)}{\{(-1.25\text{x}10^{-5})/(-0.728)\}}$ ---------- 14=_____

25I-15. $\dfrac{(97700 + 15100 - 17300)(0.217 - 0.0821 - 0.209)}{(-53.5)(49.3)(-23.5)(3.17 + 0.954 + 2.35)}$ ---------- 15=_____

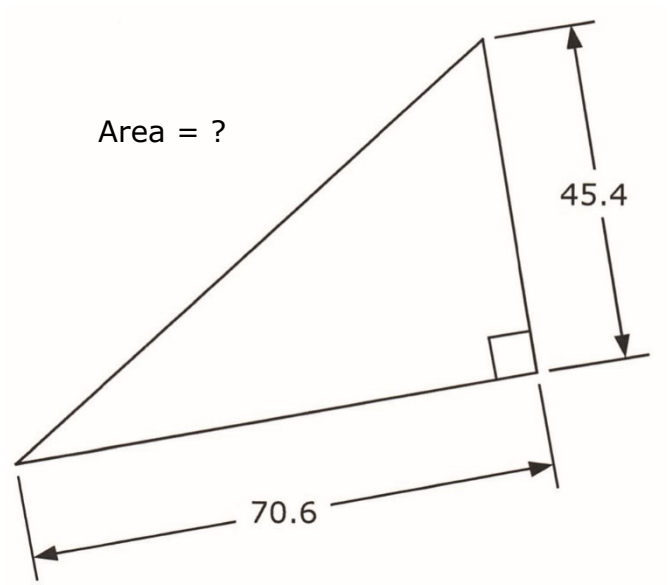
25I-16. Aydan walks to school, 1.7 mi away, in 32.8 min. What is his average walking speed? ---------- 16=_____mph

25I-17. An adult knows 28,000 English words. The Oxford Dictionary estimates that there are 170,000 English words. What fraction of all English words does an adult know? ---------- 17=_____%

25I-18. A sheet of paper is 0.004 in thick. How many sheets are stacked to produce most nearly a total thickness of 1.445 in? ---------- 18=_____integer

25I-19.

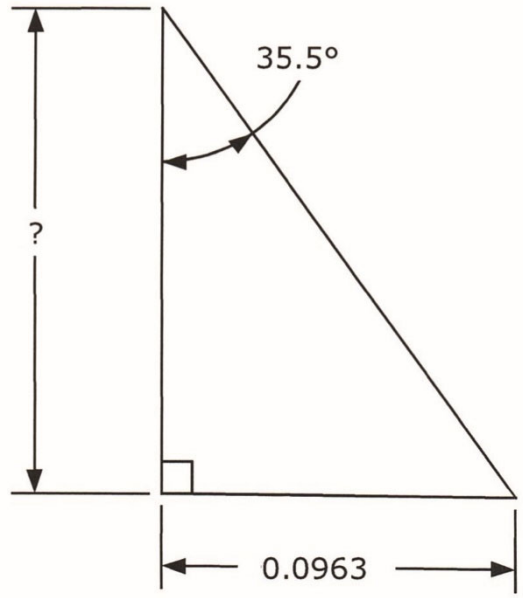
RIGHT TRIANGLE



25I-19 =_____

25I-20.

RIGHT TRIANGLE



25I-20 =_____

25I-21. $\dfrac{-0.108 + 1/(-3.42)}{1/(0.148) + 7.17} + \dfrac{1}{(-19.1)}$ ---------- 21=_____

25I-22. $\sqrt{\dfrac{(9.13)(2.67)}{506 + 277}} + 0.132$ ---------- 22=_____

25I-23. $(8.75)(0.0539)\sqrt{(-0.783)^2/0.868} + 1/\sqrt{3.24 + 4.69}$ ---------- 23=_____

25I-24. $\left[-94.5 + \sqrt{1670}\right]^2 \times [508 + 650]^2 \times \sqrt{41.1/73.9}$ ---------- 24=_____

25I-25. $(81.7)(0.809) + \sqrt{(3610)/(5.82)} + [(0.807)(6.2)]^2$ ---------- 25=_____

25I-26. A large toenail grows at a rate of 19.44 mm/yr. How long does it take to grow a large toenail by 0.55 in? ---------- 26=_____yr(SD)

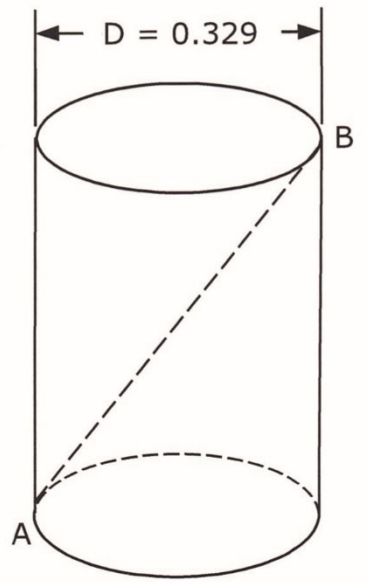
25I-27. Lucas buys a car for $8,955 and pays nothing down. He wants to pay it off over 36 months. The monthly payment, including interest, is $270.40. How much interest will Luca pay over the life of the loan? ---------- 27=$_____

25I-28. An African bush elephant weighs 13,182 lbs. The vet puts the elephant on a diet, and it loses 1,110 lbs. What is the percent change in elephant weight? ---------- 28=_____%(SD)

25I-29.

CYLINDER

Volume = 0.0362

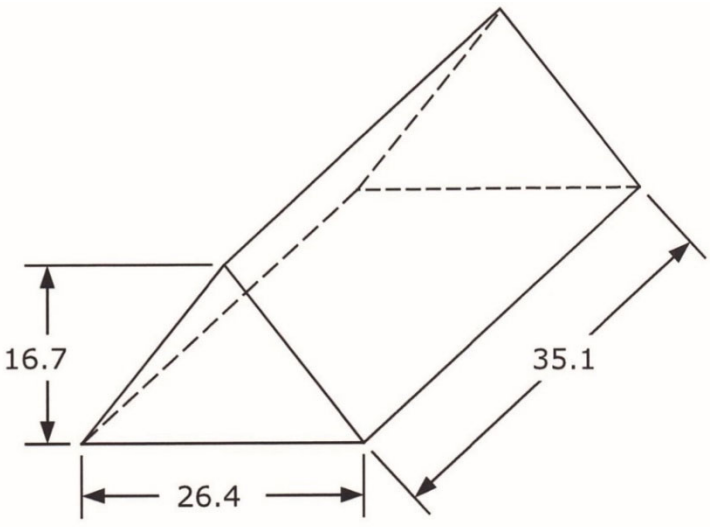


AB = ?

25I-29 =_____

25I-30.

ISOSCELES TRIANGLE PRISM



Total Surface Area = ?

25I-30 =_____

25I-31. $\dfrac{(-0.524 + 0.97)^2}{\sqrt{58.5 - 44.9}} + \dfrac{0.0221}{\sqrt{0.371 + 0.422}}$ ---------- 31=_____

25I-32. $\sqrt{\dfrac{1/(435 - 267)}{(194)(4.29 + 0.58)^2}} + (-7.61)^2(4.28\text{x}10^{-5})$ ---------- 32=_____

25I-33. $\dfrac{(5.41)^2 + \sqrt{775}}{\sqrt{(9.85)(-49.8)^2}} + \dfrac{\sqrt{\sqrt{(4.48\text{x}10^5)(0.231)}}}{-73.2 + 144}$ ---------- 33=_____

25I-34. $\dfrac{[(0.665 - 0.209)(0.893/0.769)]^{1/2}}{(0.607)^2 + (0.224 + 0.42)^2 + 0.23}$ ---------- 34=_____

25I-35. $\dfrac{\dfrac{1}{6.29\text{x}10^8} + \dfrac{1.78\text{x}10^{-5}}{(164 + 34.4)^2} - \dfrac{\sqrt{1.08\text{x}10^{-35}}}{(8.52\text{x}10^{-5})^2}}{(-8.10\text{x}10^{-5} + 8.50\text{x}10^{-5})^2 + (-9.12\text{x}10^{-11})}$ ---------- 35=_____

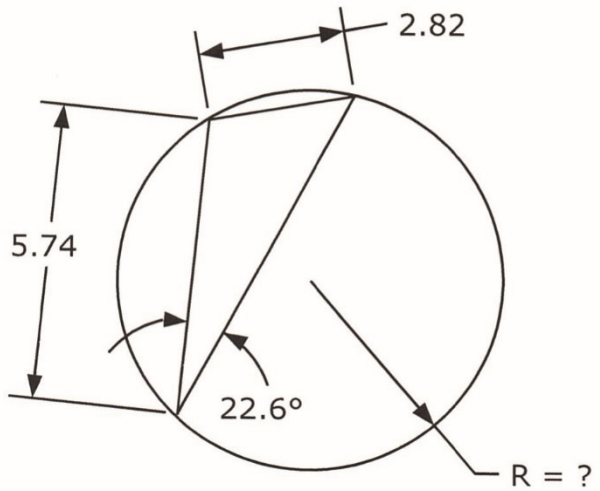
25I-36. Mateo plans to have dinner and see a movie 40 mi away. His car gets 23 mi/gal, and gas costs $3.08/gal. Dinner costs $28, and the movie costs $18. What is the percent increase in cost if he decides to take his brother along for dinner and the show, and Mateo pays for everything? ------ 36=_____%

25I-37. The product of two, consecutive, positive integers is 16,512. What is the smaller integer? ---------- 37=_____integer

25I-38. Isabella ran a marathon, 26.22 mi. After running 12.8 mi, her time was 2 hr 7 min 48 s. What should her new rate be, measured in min/mi, if she wants to finish the race in 4 hr 8 min flat? ---------- 38=_____min/mi(SD)

25I-39.

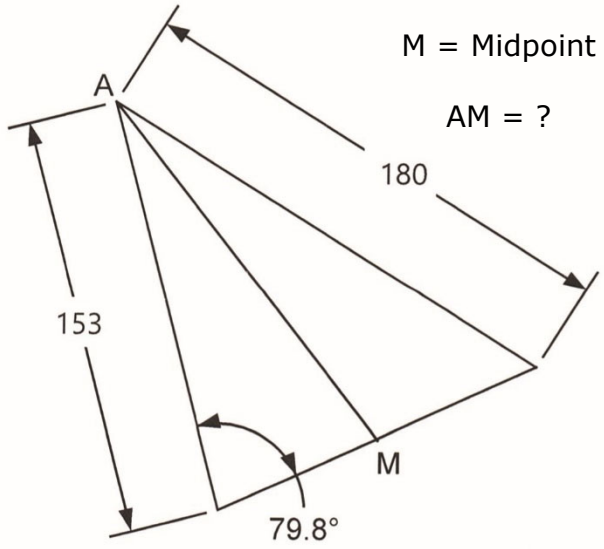
CIRCLE AND SCALENE TRIANGLE



25I-39 =_____

25I-40.

SCALENE TRIANGLES



25I-40 =_____

25I-41. $\dfrac{10^{-(0.907 - 1.2)}}{8.68\text{x}10^{7} + 3.53\text{x}10^{7}}$ ---------- 41=_____

25I-42. $\dfrac{(-14.6)}{(-4.21)}\left[1 - e^{-(0.718)(0.649)}\right]$ ---------- 42=_____

25I-43. $(7500 - 24900)\ \text{Ln}\{(-6090)(-266)\}$ ---------- 43=_____

25I-44. $(4.63)^{3} + (20.5 - 13.3)^{2.87}$ ---------- 44=_____

25I-45.(deg) $\dfrac{\cos\{(72.1°)/(6)\}}{\sin\{57.4° - 92.6°\}}$ ---------- 45=_____

25I-46. A 6-in tall Olaf stuffed doll costs $9.99. How much would a 14-in tall Olaf cost if the cost is proportional to the doll volume? ---------- 46=$_____

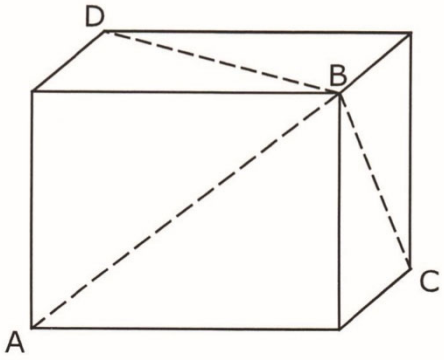
25I-47. Layla drives a golf ball, attempting to drive distances in 30-yd increments. Her actual drive distances were 25 yd, 70 yd, and 83 yd. To drive the ball 120 yd, what distance should she aim for? ---------- 47=_____ yd

25I-48. (rad) Solve for x if $2\pi<x<8$ and $\dfrac{\sqrt{x}}{\sin x} = 15 - x$. ---------- 48=_____

25I-49.

RECTANGULAR SOLID

AB = 15.6 BC = 10.3 BD = 12.9

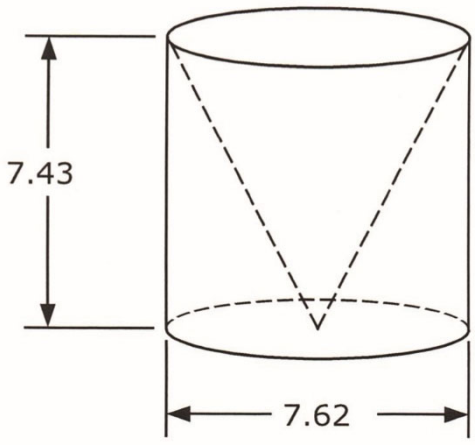


Volume = ?

25I-49 =_____

25I-50.

CYLINDER WITH CONICAL CAVITY



Total Surface Area = ?

25I-50 =_____

25I-51. $10^{+(0.498)} + 10^{-(0.18)} + \left[10^{(0.521/0.766)} - 10^{(0.136)}\right]^{1/2}$ -- 51=_____

25I-52. $\dfrac{\pi + e^{(0.834 + 0.459)}}{1.07 - e^{-(0.122 - 0.611)}}$ ---------- 52=_____

25I-53. $\dfrac{\text{Ln}(9.71\text{x}10^{-4} + 0.00163)}{9.11\text{x}10^{-6}} + \dfrac{\text{Ln}(5.13\text{x}10^{-4})}{1.32\text{x}10^{-4} - 1.15\text{x}10^{-4}}$ ---------- 53=_____

25I-54. $\dfrac{1}{(0.27)^{(-0.312)}} + (0.807 + 0.224)^{(0.988 - 0.524)}$ ---------- 54=_____

25I-55.(rad) $\dfrac{\arctan\{2.64 + (5.82)(0.265)\}}{\arcsin\{(0.996 + 0.594)/1.79\}}$ ---------- 55=_____

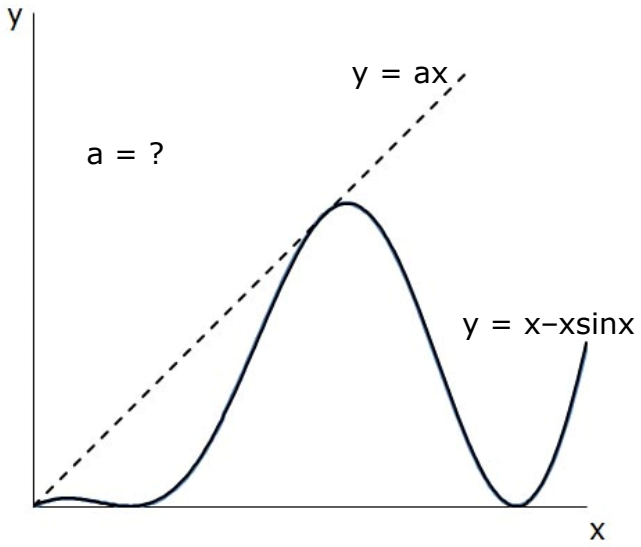
25I-56. What is the y value at the minimum point on the curve $y = 25(13\text{-}x)^2 + 17$? ---------- 56=_____

25I-57. Mila's typo rate increases the faster she types. Her net typing speed is given by $W_n = W - (W^2)/150$, where W is her actual typing speed and the last term reflects the effect of typos. What should her actual typing speed W be to maximize her net typing speed W_n? ---------- 57=_____words/min

25I-58. Solve for the product of the determinants of $\begin{bmatrix} 7 & 3 \\ 7 & -8 \end{bmatrix}$ and $\begin{bmatrix} 5 & 9 & 4 \\ 9 & -9 & -6 \\ 4 & -6 & 2 \end{bmatrix}$. ---------- 58=_____

25I-59.

Radians

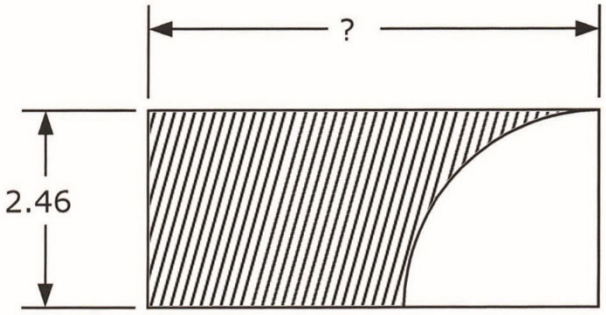


25I-59 =_____

25I-60.

RECTANGLE AND QUARTER CIRCLE

Hatched Area = 9.27



25I-60 =_____

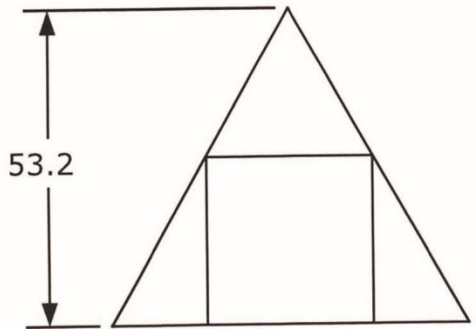
25I-61. Charlotte flew 1368 mi from Dallas to New York City. The scheduled flying time was 3 hr 29 min. The plane was 15 min late taking off, but it made up the time by flying faster than normal. What was the new plane speed? ---------- 61=_____mph(SD)

25I-62. It is estimated that there are 2.6×10^{81} atoms in the observable universe. What is this number raised to the 137th power? ---------- 62=_____

25I-63. A coin dropped off the top of the Eiffel Tower hits the ground in 7.821 s. How tall is the Eiffel Tower? ---------- 63=_____ft

25I-64.

EQUILATERAL TRIANGLE AND SQUARE

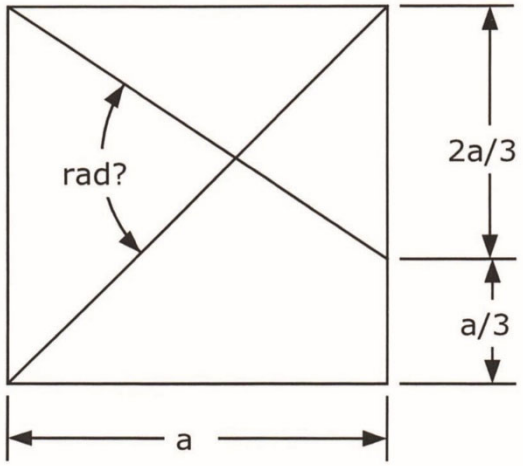


Square Area = ?

25I-64 =_____

25I-65.

SQUARE



25I-65 =_____

25I-66. $\left[\dfrac{(10^{\pi}) \times 10^{\{(9.94)(0.417)\}}}{(7.82)10^{0.673}}\right]^3$ ---------- 66=_____

25I-67. (rad) $\cos(2.85 - 2) - \cos(2.85 + 2)$ ---------- 67=_____

25I-68. (rad) $(8.67)\left[\dfrac{\cos(-2.86)}{(-2.86)} + \dfrac{\cos(3.63)}{(3.63)}\right]$ ---------- 68=_____

25I-69. $\dfrac{1}{(0.5)} + \dfrac{1}{3(0.5)^3} + \dfrac{1}{5(0.5)^5} + \dfrac{1}{7(0.5)^7}$ ---------- 69=_____

25I-70. $\dfrac{1}{\sqrt{(33.1)^2 - (721)}}$ $\text{Ln}\left\{\dfrac{(102) - \sqrt{(33.1)^2 - (721)}}{(102) + \sqrt{(33.1)^2 - (721)}}\right\}$ ---------- 70=_____

25I-1 = 1.44
= 1.44×10^{0}

25I-2 = −0.484
= -4.84×10^{-1}

25I-3 = 0.0883
= 8.83×10^{-2}

25I-4 = 248
= 2.48×10^{2}

25I-5 = 3300
= 3.30×10^{3}

25I-6 = 285
= 2.85×10^{2}

25I-7 = −2.94
= -2.94×10^{0}

25I-8 = 1.10
= 1.10×10^{0}

25I-9 = 384
= 3.84×10^{2}

25I-10 = 20.9
= 2.09×10^{1}

25I-11 = −3.19
= -3.19×10^{0}

25I-12 = −0.146
= -1.46×10^{-1}

25I-13 = 0.000307
= 3.07×10^{-4}

25I-14 = 195
= 1.95×10^{2}

25I-15 = −0.0176
= -1.76×10^{-2}

25I-16 = 3.11
= 3.11×10^{0}

25I-17 = 16.5
= 1.65×10^{1}

25I-18 = 361 integer

25I-19 = 1600
= 1.60×10^{3}

25I-20 = 0.135
= 1.35×10^{-1}

25I-21 = −0.0811
= -8.11×10^{-2}

25I-22 = 0.308
= 3.08×10^{-1}

25I-23 = 0.751
= 7.51×10^{-1}

25I-24 = 2.88×10^{9}

25I-25 = 116
= 1.16×10^{2}

25I-26 = 0.72
= 7.2×10^{-1} (2SD)

25I-27 = $779.40

25I-28 = −8.42
= -8.42×10^{0} (3SD)

25I-29 = 0.538
= 5.38×10^{-1}

25I-30 = 2860
= 2.86×10^{3}

25I-31 = 0.0788
= 7.88×10^{-2}

25I-32 = 0.00362
= 3.62×10^{-3}

25I-33 = 0.619
= 6.19×10^{-1}

25I-34 = 0.718
= 7.18×10^{-1}

25I-35 = −21.1
= -2.11×10^{1}

25I-36 = 81.1
= 8.11×10^{1}

25I-37 = 128 integer

25I-38 = 8.96
= 8.96×10^{0} (3SD)

25I-39 = 3.67
= 3.67×10^{0}

25I-40 = 155
= 1.55×10^{2}

25I-41 = 1.61×10^{-8}

25I-42 = 1.29
= 1.29×10^{0}

25I-43 = −249000
= -2.49×10^{5}

25I-44 = 388
= 3.88×10^{2}

25I-45 = −1.70
= -1.70×10^{0}

25I-46 = $126.91

25I-47 = 123
= 1.23×10^{2}

25I-48 = 6.59
= 6.59×10^{0}

25I-49 = 450
= 4.50×10^{2}

25I-50 = 323
= 3.23×10^{2}

25I-51 = 5.66
= 5.66×10^{0}

25I-52 = −12.1
= -1.21×10^{1}

25I-53 = -1.10×10^{6}

25I-54 = 1.68
= 1.68×10^{0}

25I-55 = 1.22
= 1.22×10^{0}

25I-56 = 17.0
= 1.70×10^{1}

25I-57 = 75.0
= 7.50×10^{1}

25I-58 = 55400
= 5.54×10^{4}

25I-59 = 2.00
= 2.00×10^{0}

25I-60 = 5.70
= 5.70×10^{0}

25I-61 = 423
= 4.23×10^{2} (3SD)

25I-62 = $7.10 \times 10^{11,153}$

25I-63 = 984
= 9.84×10^{2}

25I-64 = 610
= 6.10×10^{2}

25I-65 = 1.37
= 1.37×10^{0}

25I-66 = 1.45×10^{17}

25I-67 = 0.523
= 5.23×10^{-1}

25I-68 = 0.803
= 8.03×10^{-1}

25I-69 = 29.4
= 2.94×10^{1}

25I-70 = −0.0198
= -1.98×10^{-2}