COMP 354 - Team F

This section tests each of the functions below with real world problems in order to determine whether our Eternity calculator is reliable to use. We also used an online calculator frequently as reference to compare our calculator's calculation precision/capability against it.

The following are 5 word problems that can be solved using our calculator, using the following functions:

1) **Sin(x)**
2) **e^(x) e**
3) **Ln(x)**
4) **x^y**
5) **Square root of x**

1) Word problem using Sin(x)

At 57" from the base of a building you need to look up at 55° to see the top of a building. What is the height of the building? (Answer must be in the form of one decimal place)

Tan(55°) = height/57

(Note:You must convert degrees to radiants to solve problem. Input the degree value x π/180)

55 degrees = 0.959931 radiants
height = 57 × tan(55°) = 81.4"

Ans: Our Eternity calculator result: 81.40443637404839 = 81.4"

2) Word problem that involves e^x

Mitchell opened a savings account and deposited $300.00 as principal. The account earns 13% interest, compounded continuously. What is the balance after 1 year?

Use the formula A=Pert, where A is the balance (final amount), P is the principal (starting amount), e is the base of natural logarithms (≈2.71828), r is the interest rate expressed as a decimal, and t is the time in years.

Round your answer to the nearest cent.

Note:
Continuously compounded interest:
A=Pert
The variables in the equation are A, P, r, and t. The letter e is a constant.
A is the balance (final amount).
P is the principal (starting amount).
e is the base of natural logarithms.
r is the interest rate expressed as a decimal.
t is the time in years.

P=$300.00, r=13%=0.13, t=1 year

Now plug these values into the equation and solve for *A*.

Plug in P=300, r=0.13, and t=1
= 300e0.13
≈ 341.648515
≈ $341.65

Ans: Our Eternity calculator result:: 341.6485149973866 which is 341.65 when rounded.

3) Logarithmic word problem Ln(x)

The hydrogen ion concentration in a substance is $[H+] = 0.98$. We need to evaluate the pH at the given value of $[H+]$. Determine whether the substance is acidic or not (i.e. if the pH is less than 7).

pH = – log[H+] = – log[0.98]

Ans:
Online calculator result: 0.0087739243
Our Eternity calculator result: 0.00877392430750515
The pH is less than 7, so the substance is acidic.

4) Power Function word problem x^y
Suppose a radioactive substance decays at a rate of 3.5% per hour. What percent of the substance is left after 6 hours?

100%-5.5% = 96.5%
1-3.5 = 0.965
(0.965)^n x 100
(0.965)^6 x 100 =

Ans:
Online calculator result: 80.7539696082015625
Our Eternity calculator result: 80.75396960820154

5) Square root word problem √x

The area of a square screen is 100.35 cm2. Find the side length of the screen with an accuracy of 2 decimal places.

Area of square = (Side length)2

s = √100.35

Ans:

Online calculator result: 10.0174847142

Our Eternity calculator result: 10.0174847142384