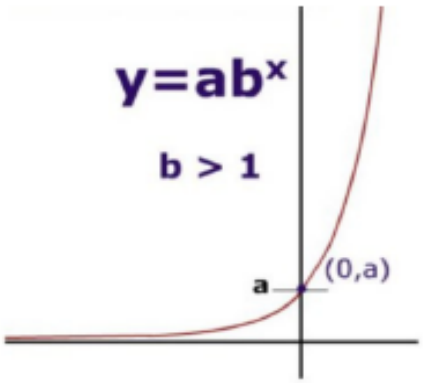
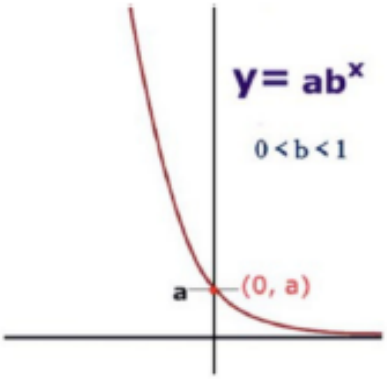
Problem 1: - Give a brief description, not exceeding one page, of your function, including the domain and co-domain of function, and the characteristics that make it unique. To ensure that you have attained sufficient background, Test 1 will have a problem related to your function.

Solution: - My function abˆ x
This exponential function abˆ x means y increases exponentially as raising x. The initial quantity is given by the value that is easy to see (let x=0 and y=a left). Here value b is the growth factor. If we limit b to 0<b1, the function will increase.

The graphs for the function are depicted below:



Exponential growth



Exponential decay

Domain: - [∞ to ∞]
Range: - [0 to ∞]

Characteristics:

- The exponential growth as shown above, is when b>1.
- If $0 < b < 1$, there is an exponential decay.
- The graph does not have a constant rate of change having constant ratios.
- This graph is growing by common factors over equal intervals.

Problem 2: - Express requirements of your function based on the style given in the ISO/IEC/IEEE 29148 Standard. Associate each requirement with a unique identifier. Make any assumptions explicit.

Solution: - Requirements

First Requirement

ID = FR1

Type = Functional Requirements

Version = 1.0

Difficulty = Hard

Description = The input should be a real number

Second Requirement

ID = FR2

Type = Functional Requirements

Version = 1.0

Difficulty = Hard

Description = For real numbers ranging between [$-\infty$ to $+\infty$], the results should always be in the range of [0, ∞]

Third Requirement

ID = FR3

Type = Functional Requirements

Version = 1.0

Difficulty = Hard

Description = The output should allow negative numbers

Fourth Requirement

ID = FR4

Type = Functional Requirements

Version = 1.0

Difficulty = Easy

Description = The output should show infinite numbers

Problem 3: - Collaboratively brainstorm and mind map with your team members to decide a pseudocode format. The pseudocode format must be identical across the team. Select algorithms for implementing your function and all its subordinate functions, if any. Give technical reasons for selecting each of the algorithms, including their advantages and disadvantages. (This, by reference, means that you must have at least two options to choose from.)

ALGORITHM 1: ALGORITHM - NAME (a,b,x (input set))

```
begin:
1. verifyInputIsRealNumber(a,b,x)
2. Set temp = 1
3.       FOR COUNTER = 1 TO x
4.           UPDATE TEMP TO TEMP * b
5. counter = 0
6. temp2 = 1
7.       UPDATE temp2 TO a*temp2
8. PRINT TEMP2
9. READ new value for X
10. REPEAT the algorithm for new value
end
```

ALGORITHM 2: verifyInputIsRealNumber(a,b,x)

```
begin:
1.IF a,b,x ∈ −∞ to +∞
2.       continue with processing
3. else
4.       print error and take new inputs
end
```

(a) For Input : use READ

(b) For output : use PRINT

(c) For calculation : use COMPUTE

(d) For Initialize: use SET

(e) For Add one: use INCREMENT

Advantages:-

(a) Exponential function is used to model population and help coroners determine the time of death.

(b) This function also assist in computing investments and used in radioactive decay.

Disadvantages:-

(a) Exponential functions are always either positive or negative.

(b) The function lives entirely on one side or other side of the x-axis.