Q1 Building a matrix
20 Points

Q1.1
4 Points

First, define the vector **t** as the sequence of numbers starting at zero and ending at 1 with an increment of 0.1. You should use the "colon" operator in your solution. Paste your code below:

```
t=[0:0.1:1]
```

Q1.2
10 Points

Now, generate a matrix **m** with 5 columns, where each column is equal to the vector **t** raised to the power of the column number (on an elementwise basis).

For example, the first column will have the elements of **t** raised to the first power, the second column will be the elements of **t** raised to the second power, etc.
Paste your code below:

```
m = [t.^1' t.^2' t.^3' t.^4' t.^5']
```

Q1.3
6 Points

Then use the command:
>> plot(t,m);
Explain what the plot function did with the matrix **m**.

Plot function graphed each column separately in a different color

Q2 Computing the Fibonacci Sequence
12 Points

The Fibonacci sequence is a famous sequence of numbers, in which each number is equal to the sum of the two preceding numbers.

Q2.1
8 Points

Write code to compute the first 30 values of the Fibonacci sequence, beginning with 1 and 1 as the first two values. Paste your code below.

```
fib = [1 1];
      for i = 3:30
          fib(i) = fib(i-1) +fib(i-2);
          end
   ## to display values##  fib'
```

Q2.2
4 Points

What was the 29th number in your computed Fibonacci sequence?

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Q3 Inverse sine – using a new function
9 Points

Q3.1
3 Points

Create a vector **v** containing the values from -1 to 1 with increments of 0.1.

```
v = [-1:0.1:1]
```

Q3.2
6 Points

Then use a MATLAB function to compute from this vector a new vector a containing the angles such that sin(**a**) = **v**. There is a built-in MATLAB function to do this, but you will need to find it. Paste your code below:

```
angle = asind(v)'
```

Q4 Doing math with vectors

9 Points

We will use vectors and vector math to plot a graph of an oscillating function. We can start by defining the x values we are interested in. Execute the following command:
>> x=0:0.1:10;

Q4.1

3 Points

How many elements are there in the vector **x**?

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Q4.2

6 Points

Create a second vector y, where each value of y is equal to the exponential of the cosine of the corresponding value in x. (Hint: the first value in y should exp(1) or about 2.718). Generate a plot of y as function of x using:
plot(x,y);
Upload a screenshot of your graph.