Q1: Write a program (using FUNCTION statement) to compute the nth sum of the series \( S(x) = \frac{1}{x^2} \), from 1 to 1000.

Solution:

FUNCTION \( s(x) \)
\[
    s = \frac{1}{x^2}
\]
END FUNCTION

FUNCTION sum(low%, high%)
    ret = 0
    FOR i = low TO high
        ret = ret + s(i)
    NEXT i
    sum = ret
END FUNCTION

PRINT sum(1, 1000)

Q2: Create a program that wills double the value of \( x \) using FUNCTION statement.

Solution:

The main Program:

INPUT "Please Enter First Number: ", Num1
INPUT "Please Enter Second Number: ", Num2
Answer = Power(Num1, Num2)
PRINT "The Answer Is: "; Answer
Create a function called Power and add the following code:

```plaintext
FUNCTION Power (x , y )
   Power = x ^ y
END FUNCTION
```

**Q3:** Write a program, using DIM, to find the lattice density to the following table of metals knowing that:

\[ LD = \frac{n(Aw)}{V(An)} , V = \frac{64 (r)^3}{3 \sqrt[3]{3}} \]

Where: \( LD = d \) = Lattice Density, \( Aw = a \) = Atomic weight, \( n = \) atoms number= 2, \( An = \) Avogadro’s number= 6.023*10^23, \( r = \) Atomic radius

<table>
<thead>
<tr>
<th>Metal</th>
<th>Atomic weight</th>
<th>Atomic radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cr</td>
<td>51.966</td>
<td>1.249</td>
</tr>
<tr>
<td>Nb</td>
<td>92.91</td>
<td>1.426</td>
</tr>
<tr>
<td>W</td>
<td>183.85</td>
<td>1.377</td>
</tr>
<tr>
<td>Li</td>
<td>6.94</td>
<td>1.887</td>
</tr>
</tbody>
</table>

**Solution:**

```plaintext
DIM m$(4), a(4), r(4), d(4)
FOR I = 1 TO 4
   N = 2
   AN = 6.023E+23
   READ a(I), r(I)
   v = (64 * r(I)^3) / (3 * 3 ^ (1 / 3))
   d(I) = (N * a(I)) / (AN * v)
NEXT I
DATA 51.966,1.249,92.91,1.426,183.85,1.37,6.94,1.887
FOR j = 1 TO 4
   READ m$(j)
   PRINT "metal"; m$(j), "density"; d(j)
NEXT j
DATA Cr,Nb,W,Li
```