INTRODUCTION TO MATLAB
HOMEWORK 3

1. Write a script to calculate the sum of a geometric series with (N+1) terms for the particular case of N=10 and r=1/2,

$$S = \sum_{i=0}^{N} r^i = 1 + r + r^2 + r^3 + ... + r^N$$

2. Write a script which performs the following operations (in sequence)

(i) creates a 20x40 array, A, in which each element (or entry) in rows 1 through 10 is assigned the value 1

and each element in rows 11 through 20 is assigned the value 2;

(ii) creates a new 20x40 array, B, which is the same as A except row 11 for which B(11,j) =1/j, for 1≤j≤40;

(iii) creates a new 20x41 array, C, which is the same as B for columns 1 through 40 but also includes a

column 41 in which all elements are assigned the value 3;

(iv) creates a new 20x41 array, P, which is the same as C except the first ten entries on the main diagonal

for which is P(i,i) = 2 * C(i,i) for 1≤i≤10;

(v) creates a new 20x41 array, Q, which is the same as P except the (1,2) entry for which Q(1,2) is

assigned the value 7;

(vi) creates a new 20x41 array, R, in which each element is the square of the corresponding element in

Q- for example, R(1,2) will be assigned the value 49;

(viii) creates a scalar "bigsum" which is the sum of all the elements (820 in total) of the array R.

Ref: MIT Open Course Material, Numerical Computation for Mechanical Engineers Exercises.

3. Take an integer as an input variable. Check whether this integer is prime or not.