Create a function in MATLAB for calculating the mean (תוחלת) and standard deviation (סטיית תקן)

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```
function [mean,stdev] = stat(x)
n = length(x);
mean = sum(x)/n; OR mean = avg(x,n);
stdev = sqrt(sum((x-mean)^2/n));
end
```

Create a function in MATLAB for calculating the sum of the N+1 first terms of geometric series
$1 + a + a^2 + ... + a^N$ (**4 lines only!!!).**

Create a function in MATLAB for calculating the sum of the N+1 first terms of geometric series $1 + a + a^2 + ... + a^N$.

```
function ssum = geom(a,N)
n=0:N;
ssum = sum(a.^n);
end
```

Create a function in MATLAB to calculate the sum of an arbitrary geometric series.

Create a function in MATLAB to calculate the sum of an arbitrary geometric series.

```
function ssum = geomInf(a,N)
if(N==inf)
if(abs(a)>=1) error('This geometric series will diverge.');
else ssum=1/(1-a);
end
else n=0:N;
ssum = sum(a.^n);
end
end
```

Create a function in MATLAB to calculate the biggest value of a matrix.

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```
function y = big(x)
y=abs(x(1,1));
for i=1:size(x,1)
for j=1:size(x,2)
if abs(x(i,j))>y
y=abs(x(i,j));
end
end
end
```

Create a function in MATLAB to find all prime numbers מספר ראשוני of the form $2^n - 1$ for $n = 1..20$.
Tip. Use functions: factor

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```
n=20;
k=0;
for i=1:n
if (factor(2^i-1)==2^i-1)
2^i-1
k=k+1;
end;
end
end
k
```

מצא את תמונת ההסתעפות של השורשים של המשוואה הבאה ב־MATLAB:

$$x^3 + cx = 0.1, \quad -3 \leq c \leq 2.$$

רמז: להשתמש בפקודות roots ,imag

מצא את תמונת ההסתעפות של השורשים של המשוואה הבאה $x^3 + cx = 0.1, \quad -3 \leq c \leq 2.$:MATLAB-ב

```
a=[];
for c=-3:0.01:2
q=roots([1,0,c,-0.1]);
for j=1:size(q,1)
if imag(q(i))==0 a=[a;[c,q(i)]];
end
end
end
plot(a(:,1),a(:,2),'.')
```