
```
clc
clear
close all
format long g

%display name and assignment details
disp('Zyad Khan - MATLAB Chapter 10 Assignment')

%Problem 1 - Sequence
syms k
f(k)=(1)/((k)*(k+1));
sequence = eval(subs(f(k),k,1:25));
convergence = limit(f(k),k,inf);

%Graph the Sequence
plot(sequence , 'o');
grid on; hold on;
title('Graph of the Sequence')
legend('Sequence')
xlabel('x')
ylabel('y')

%Determine Convergence or Divergence
if isfinite(convergence)
    disp(['The sequence ' char(f(k)) 'converges and approaches the '
        'value of ' char(convergence)])
else
    fprintf('The sequence diverges.')
end

%Problem 2 - Infinite Series
syms n
f(n)=(1)/((n)*(n+1));
sum = eval(subs(f(n),n,1:4));
partialSums=cumsum(sum);
disp(['The first term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(1)) '.']);
disp(['The second term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(2)) '.']);
disp(['The third term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(3)) '.']);
disp(['The fourth term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(4)) '.']);

%Graph the Infinite Series
figure(2)
partial50 = eval(subs(f(n),n,1:50));
partialSums50 = cumsum(partial50);
plot (partialSums50, 'o')
title('Graph of Partial Sums')
xlabel('x')
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ylabel('y')
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```
disp(['The series converges and approaches the value '
      num2str(partialSums50(50)) ' .'])
```

Zyad Khan - MATLAB Chapter 10 Assignment

The sequence $1/(k(k + 1))$ converges and approaches the value of 0*

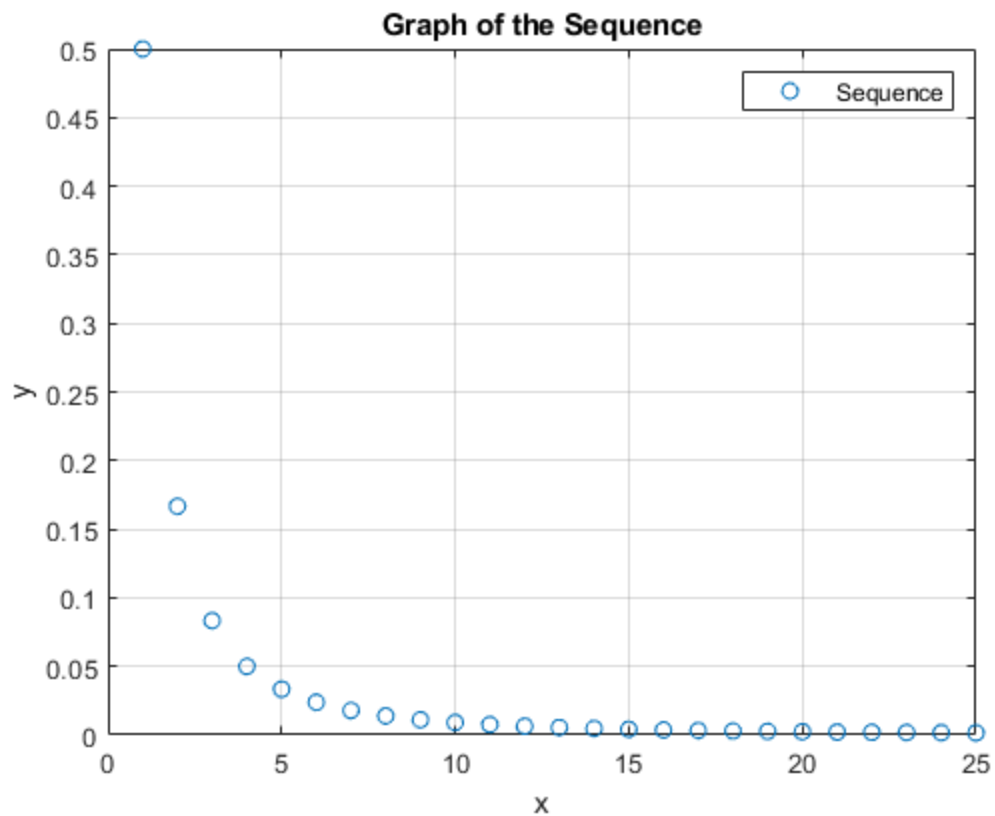
The first term of the partial sums for the infinite series $1/(n(n + 1))$ is 0.5.*

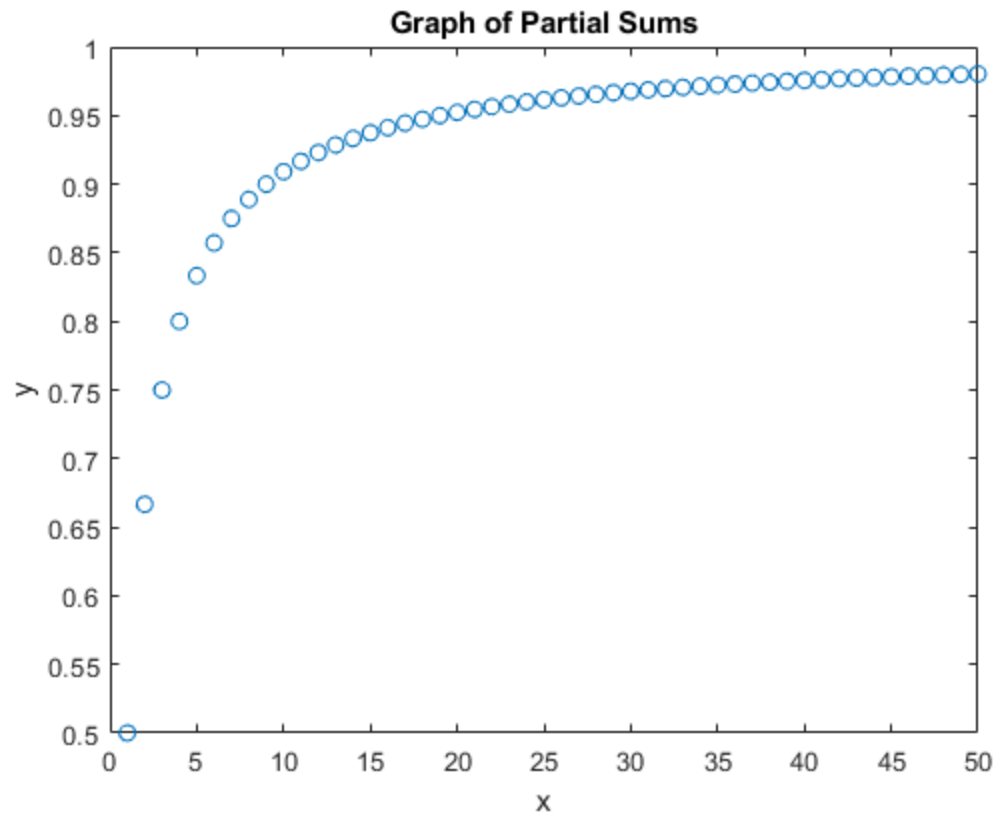
The second term of the partial sums for the infinite series $1/(n(n + 1))$ is 0.66667.*

The third term of the partial sums for the infinite series $1/(n(n + 1))$ is 0.75.*

The fourth term of the partial sums for the infinite series $1/(n(n + 1))$ is 0.8.*

The series converges and approaches the value 0.98039.





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