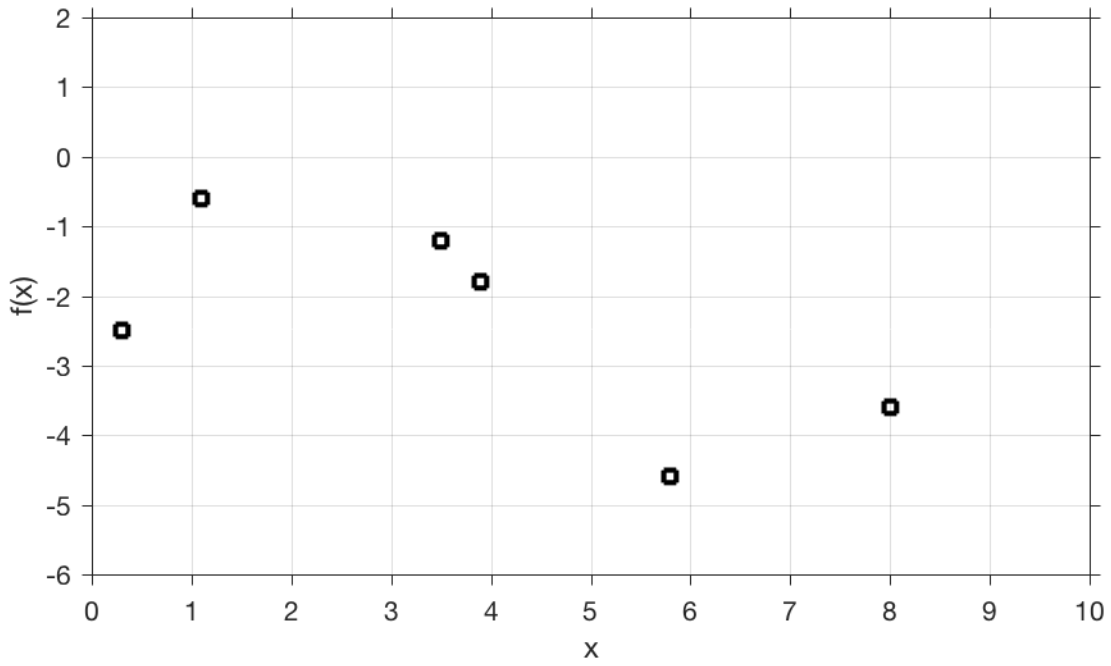
EOSC 211: Interpolation

Group #: _____ Name: _____

Interpolation:



The figure above contains estimates, f_i, of a function f(x) taken at data points x_i. The values of x_i, f_i are given in Table 1 below.

Table 1:

x_i	0.3	1.1	3.5	3.9	5.8	8.0
f_i	-2.5	-0.6	-1.2	-1.8	-4.6	-3.6

A. **Using the graph only** estimate the values of f(x) at evenly spaced points x=1,2,3,…8. Plot the points on the graph and enter the estimated values of f(x) from the graph in table 2 below

x_i	1	2	3	4	5	6	7	8
f_i								

B. Now we will use math and find an "exact" value of f(x) at the point x=7 by linearly interpolating between the 2 nearest points.

a. What are the two x values in Table 1 that are closest to x=7? Call these two points x_j and x_{j+1}.

$x_j =$
$x_{j+1} =$

b. What is the slope of the line joining these two points? Call this *m*

$m =$

c. How would you estimate the value f_{new} of f(x) at a point x_{new} that is part way between x_i and $x_{i+1.}$ Write down the formula you would use to estimate f_{new} and calculate its value at $x_{new} = 7$.