

1. The following table gives values of a continuous function  $f$ :

$x$	0	2	3	5.5	9
$f(x)$	5	7	4	1	3

Assume that the values of  $f$  between two consecutive data points are either always increasing or always decreasing. Estimate the area under  $f$  using a

- (a) lower sum
- (b) upper sum

2. The velocity of an object moving along a straight line (without changing its direction) is given by the following table:

Time (sec)	0	2	3	5.5	9
Velocity (ft/sec)	5	7	4	1	3

Find lower and upper estimates for the distance travelled by the object, assuming that the velocity between two consecutive observations times is either always increasing or always decreasing. Use proper units for your answer.

3. Fuel leaking out of a gas tank is recorded in the following table:

Time (hrs)	0	2	3	5.5	9
Leakage (gal/hr)	5	7	4	1	3

Find lower and upper estimates for the total amount of fuel leaked over the 9 hour period. Use proper units for your answer.

4. The following table records the cross-sectional areas of an irregular nine foot pole at various points  $x$  along its length.

$x$ (ft)	0	2	3	5.5	9
Cross-sectional area (ft <sup>2</sup> )	5	7	4	1	3

Find upper and lower estimates for the volume of the pole. Use proper units for your answer.