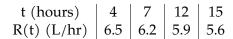
CHAPTER 1

Riemann Sums

Exercise 1



A tank contains 50 liters of water after 4 hours of filling. Water is being added to the tank at rate R(t). The value of R(t) at select times is shown in the table. Using a right Riemann sum, estimate the amount of water in the tank after 15 hours of filling.

Working Space —

_ Answer on Page 3

This is a draft chapter from the Kontinua Project. Please see our website (https://kontinua.org/) for more details.

Answers to Exercises

Answer to Exercise 1 (on page 1)

The volume of water will be the amount of water at 4 hours (50 liters) plus the area under the graph of R(t) from t=4 to t=15. We will estimate this area with a right Riemann sum. The approximate volume added from t=4 to t=7 is (7-4)*(6.2)=18.6 liters. The approximate volume added from t=7 to t=12 is (12-7)*(5.9)=29.5 liters. The approximate volume added from t=12 to t=15 is (15-12)*(5.6)=16.8 liters. Therefore, the approximate total volume of water in the tank at t=15 is 50+18.6+29.5+16.8=114.9 liters.