

Chapter 22

Net Change in Amount and Area: Introducing the Definite Integral

22.1 Finding Net Change in Amount: Physical and Graphical Interplay

- These results are approximate, dependent upon eyeball interpretation of the graph in the text.
 - 10 AM as after 10 AM the rate of arrival is greater than the service rate.
 - \approx 12 noon. After this the arrival rate decreases.
 - \approx 2 PM. After this the arrival rate is less than the service rate.
 - $\approx 165 - 120 = 45$ people. Arrivals (area under $r(t)$ 10 to 2) minus those served 10 to 2.
 - Those arriving at 2 PM must wait through the longest line. $45/15 = 3$ hours to wait.
 - $\approx 45 + 23 - 30 = 32$. Those in line, plus arrivals minus those served.
 - ≈ 225 people (area under curve.)
- upper bound is right sum $= 12(3) + 20(4) + 23(3) + 25(3) = 260$ grams
lower bound is left sum $= 10(3) + 12(4) + 20(3) + 23(3) = 207$ grams
 - Impossible to know without more data. Plot of points shows no trend of concave up or down.
- Distance traveled = the area under the curve.
 - 4
 - 30
 - 8