

Solutions

Each answer shows the steps, then the **result**.

2.1

- $\Delta x = 3$; left = $3(2 + 5 + 6) = 39$

2.2

- right = $3(5 + 6 + 10) = 63$

2.3

- $3\left[\frac{2}{2} + 5 + 6 + \frac{10}{2}\right] = 3(17) = 51$. (Equivalently the average of 39 and 63.)

3.1 B

- for an increasing function the left sum under-estimates

3.2

(a)

- $4(12 + 20 + 24) = 224$ m

(b)

- Over-estimate — v is increasing, so right endpoints are the largest values on each subinterval

3.3

- Too large — for a concave-up curve each trapezoid lies **above** the curve, so the trapezoidal sum over-estimates