2007 AB5/BC5:

\[ \int_0^{12} r'(t) \, dt \approx 2(4.0) + 3(2.0) + 2(1.2) + 4(0.6) + 1(0.5) \]
\[ = 19.3 \text{ ft} \]
\[ \int_0^{12} r'(t) \, dt \text{ is the change in the radius, in feet, from} \]
\[ t = 0 \text{ to } t = 12 \text{ minutes.} \]

(d) Since \( r \) is concave down, \( r' \) is decreasing on \( 0 < t < 12 \).
Therefore, this approximation, 19.3 ft, is less than
\[ \int_0^{12} r'(t) \, dt. \]

Units of \( \text{ft}^3/\text{min} \) in part (b) and ft in part (c)

2004 AB3/BC3 (Form B):

(a) Midpoint Riemann sum is
\[ 10 \cdot [v(5) + v(15) + v(25) + v(35)] \]
\[ = 10 \cdot [9.2 + 7.0 + 2.4 + 4.3] = 229 \]
The integral gives the total distance in miles that the plane flies during the 40 minutes.

1 : units in (b) and (c)
2002 AB4/BC4 (Form B):

\[ \frac{3}{2}(-1 + 2(0 + 1 + 3 + 1 + 0) - 1) = 12 \]

1 : trapezoidal method

2001 AB2/BC2:

(b) \[ \frac{3}{2}(20 + 2(31) + 2(28) + 2(24) + 2(22) + 21) = 376.5 \]

Average temperature \( \approx \frac{1}{15}(376.5) = 25.1 \, ^\circ C \)

1 : answer

2 : \{ 1 : trapezoidal method \}