Quiz 11: Friday, April 4, 2008

Suppose the following is the graph of a moving object’s velocity \( v \), in feet per second, as a function of time \( t \), in seconds.

Write each of the following as an integral. Then evaluate using the graph of \( v \). Include units in your answer.

1. What is the displacement of the object from \( t = 0 \) to \( t = 2 \)?

\[
\int_0^2 v(t) \, dt = \frac{3}{2} \text{ ft}
\]

2. What is the total distance traveled by the object (without regard to direction) from \( t = 0 \) to \( t = 2 \)?

\[
\int_0^2 |v(t)| \, dt = \frac{3}{2} \text{ ft}
\]

3. What is the displacement of the object from \( t = 0 \) to \( t = 5 \)?

\[
\int_0^5 v(t) \, dt = \frac{3}{2} - \frac{5}{2} = -1 \text{ ft}
\]

4. What is the total distance traveled by the object (without regard to direction) from \( t = 0 \) to \( t = 5 \)?

\[
\int_0^5 |v(t)| \, dt = \frac{3}{2} + \frac{5}{2} = 4 \text{ ft}
\]