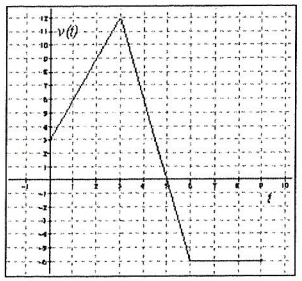
## Example 2 (graphical).

The graph below represents the velocity $v$, in feet per second, of a particle moving along the $x$-axis over the time interval from $t = 0$ to $t = 9$ seconds.




1. At $t = 4$ seconds, is the particle moving to the right or left? Explain your answer.

2. Over what time interval is the particle moving to the left? Explain your answer.

3. At $t = 4$ seconds, is the acceleration of the particle positive or negative? Explain your answer.

4. What is the average acceleration of the particle over the interval $2 \le t \le 4$? Show the computations that lead to your answer and indicate units of measure.

5. Is there guaranteed to be a time $t$ in the interval $2 \le t \le 4$ such that $v'(t) = -3/2$ ft/sec$^2$? Justify your answer.





6. At what time $t$ in the given interval is the particle farthest to the right? Explain your answer.

## Example 3 (analytic).

A particle moves along the $x$-axis so that at time $t$ its position is given by:

$$x(t) = t^3 - 6t^2 + 9t + 11$$

1. At $t = 0$, is the particle moving to the right or to the left? Explain your answer.

2. At $t = 1$, is the velocity of the particle increasing or decreasing? Explain your answer.

3. Find all values of $t$ for which the particle is moving to the left.

4. Find the total distance traveled by the particle over the time interval $0 \le t \le 5$.

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