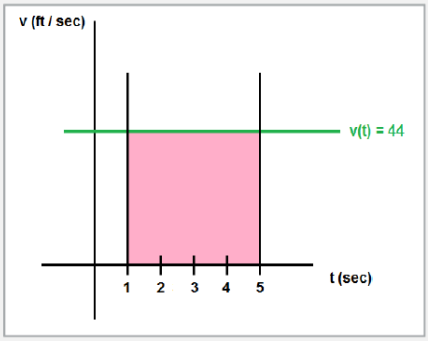
Area/Distance

(a) Consider a car moving along a straight road with constant velocity $v(t) = 44$ ft/sec. What is the distance traveled by the car from $t = 1$ sec to $t = 5$ sec?

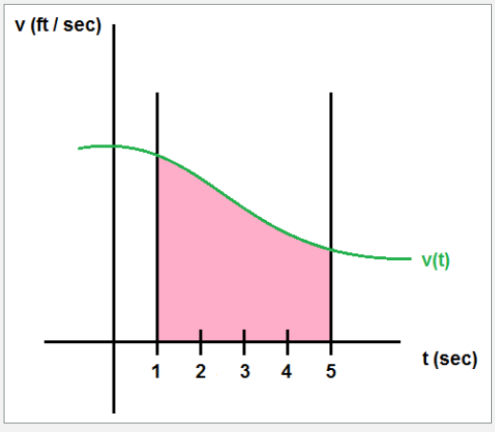
(b) What geometric calculation gives the answer (instantly!) to the above question? See the figure.



(a) Distance = Rate times Time (we have a constant rate here) so $(44 \text{ ft/sec})(4 \text{ sec}) = 176$ feet. This is the displacement of the car in the time traveled.

(b) The **area** of the above figure (rectangle) gives this same answer.

Just a quick question: Would the same reasoning apply to a car with variable (nonconstant) velocity?



Yes! There is no reason to believe this wouldn't generalize to a car with a fluctuating velocity.