

Calculus Part II

1. Consider a truck driving on a road.

(a) If the truck drives 50 mi/hr for three hours, how far has the truck gone?

(b) Look at your work again in part (a) and make sure you've included the units. Distance is measured in miles, what happened to the hour units?

(c) If the truck is driving v mi/hr for t hours, how far has the truck gone?

2. Suppose a car is moving with increasing velocity and suppose we measure the car's velocity every two second obtaining the data in the table below.

Time (sec)	0	2	4	6	8	10
Velocity (ft/sec)	20	30	38	44	48	50

(a) Estimate how far has the car traveled.

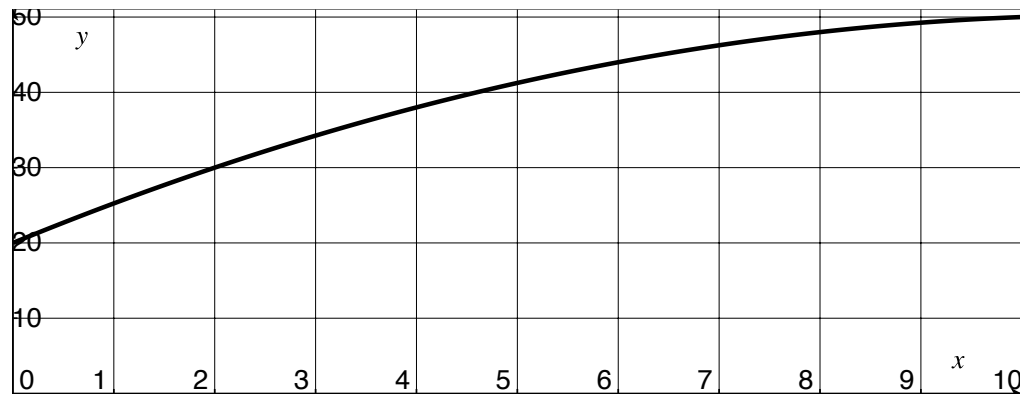
(b) Is the above answer an over estimate or underestimate of the total distance?

(c) What data would you need so that you could find a more accurate estimate of the total distance traveled?

Verify your previous answer by reading the example on the bottom of page 236.

- (d) A more precise collection of data was collected as the car was traveling and compiled into the graph below. The horizontal axis is time measured in seconds and the vertical axis is velocity measured in ft/sec.

For a moment consider the rectangular block whose bottom left corner is on the origin and whose upper right corner is on the point (2,30) (consider shading this block). What is the area of the rectangle? What are the units? Does this calculation seem familiar?



- (e) The rectangle whose area you calculated in part (d) was one term in the sum you computed in part (a). Identify the total distance that you calculated in part (a) with several rectangles on the above graph whose combined area is the same as the total distance.

Verify your previous answer by considering the graph on the top of page 238.

- (f) You could use the above graph to calculate the distance much more accurately. Explain how you would do that.

- (g) Describe what the area under the velocity function is in real world terms. Verify your answer by reading page 238 of your text book.