

## MA205

Board Sheet - 18 October 2007, Arc Length II, Lesson 35

These Steps Should Help You Compute Arc Length

- 1) Given a position vector take the derivative with respect to  $t$  or the independent variable.
- 2) Convert to speed by taking the absolute value, or the square root of the sum of the squares.
- 3) Integrate your speed from the start time to the end time.

### Now Try it on the DO Problems

MBP 2 Graph the following parametric curve and find its exact length over the specified interval. Use Technology.

$$x = e^t - t, y = 4e^{\frac{t}{2}}, -8 \leq t \leq 3$$

MBP 3 Without technology find the exact length of the curve over the specified interval.

$$\vec{r}(t) = \langle 2 \sin t, 5t, 2 \cos t \rangle, -10 \leq t \leq 10$$

Lesson Link: If a nine iron lofts a golf ball at an angle of  $60^\circ$ , how fast would you have to swing in order to hit the ball 30 feet?