A Lengthy Lecture Assignment (Lecture Assignment)

Complete this assignment and submit it to Gradescope by 4:00pm on your class day. You can print this sheet, or write on your own paper. Contact us if internet connections or other issues require alternate arrangements.

Set up (but do not solve) an integral that gives the following arc lengths.

1. $y = \sin(x)$ from $x = 0$ to $x = \pi$.

$f'(x) = \cos(x)$

$L = \int_0^{\pi} \sqrt{1 + \cos^2(x)}\, dx$

2. $x = y^{3/2}$ for $0 \le y \le 1$. (*Hint:* Would it be easier to integrate with respect to x or y?)

$f'(y) = \frac{3}{2} y^{\frac{1}{2}}$

$\int_0^1 \sqrt{1 + \frac{9y}{4}}\, dy$

One-Minute Questions: Write a sentence for each.

A. What's one mathematical question you have after watching the videos?

If the line segments go to ∞, would they have length ∞?

B. What's one interesting thing you learned from the book or videos?

That we can find many things with infinite measurements or $\lim_{n \to \infty}$.