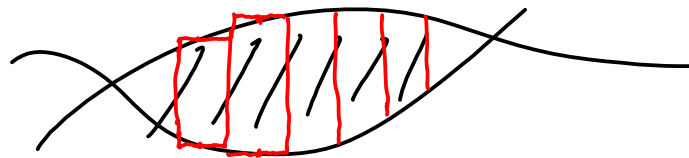


MA 140 Eng. Calculus

Quick introduction to limits.

This course is about differentiation and integration, both concepts involve limits

Integration; Problem is to calculate area between curves



Idea is to estimate and improve the estimate.

Use rectangles to approximate the area and then make those rectangles slimmer and slimmer and take the limit.

Differentiation (rates of change)

Suppose the velocity of a skydiver is

$$v(t) = 5t^2$$

What's the average speed between $t=2$ and $t=4$?

$$\frac{v(2) + v(4)}{2} = \frac{5 \cdot 4 + 5 \cdot 16}{2} = 5(2+8) = 50$$

What is the rate of change of speed at time $t = 3$?

$$\frac{dv}{dt}(3) = 2 \cdot 5 \cdot 3 = 30, \quad \frac{dv}{dt}(t) = 10t$$