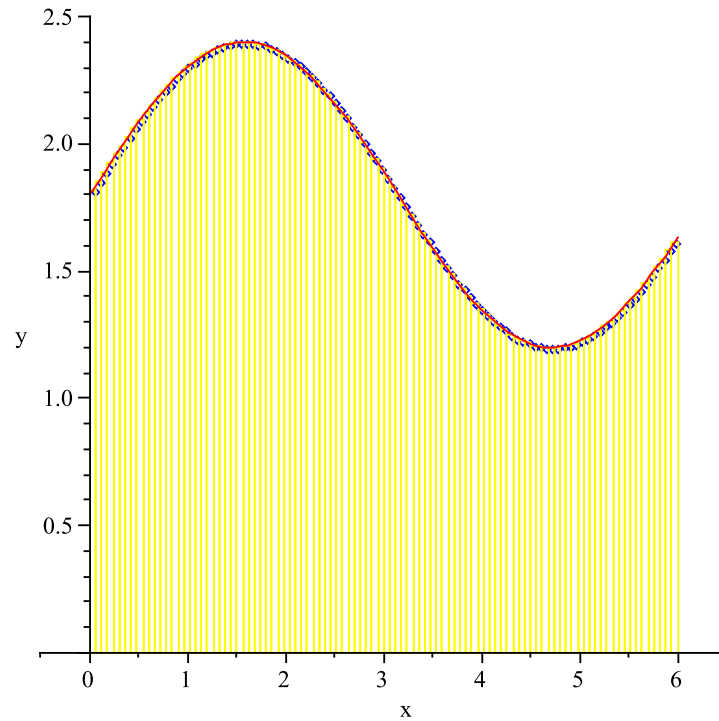


Antiderivatives/Indefinite Integration

- Main Idea: Finding the area under a curve



$F(x)$ is an antiderivative of $f(x)$ on an interval I if $F'(x) = f(x)$.

Ex: $f(x) = 2x$. Then $F(x) = x^2$...or... $F(x) = x^2 - 3$

**Antiderivatives are not unique.

NOTE: Represent antiderivatives as $F(x) + C$ (where C is the Constant of Integration)

A differential equation is an equation with x 's, y 's, and derivatives of y 's

Solve for y :

$$3x^2 = y' - 5$$

Solve for y'

$$2y' = 2x - 7$$

Notation:

- antiderivative (noun)
- antidifferentiation (verb) ← this is an operation (Symbol – \int)

$$y = \int f(x)dx = F(x) + C$$

Facts: $\int F'(x)dx = F(x) + C$ or $\frac{d}{dx} \int f(x)dx = f(x)$