

## Notes

## Examples

**Warmup.** Find the area of the region under the curve

$$f(x) = x(x - 3)^2, \quad 3 \leq x \leq 6.$$

**Example 1.** An ant is traveling along a picnic table at a velocity of

$$v(t) = 120te^{-2t} \text{ mm/s}, \quad 0 \leq t \leq 60.$$

Assuming the ant was initially at rest, what is the distance traveled during those 60 seconds?

**Example 2.** A baby is born at a height of 1.5 feet and during the first 7 years, he grows at a rate of

$$r(t) = \frac{30 \ln \sqrt{t+6}}{(t+6)^2} \text{ feet/year.}$$

How tall is he at 7 years old?

**Example 3.** Find the area bounded by the curves

$$y = 9x^3 \ln x, y = 0, x = 1, x = 7.$$

**Example 4.** During a crazy weekend on a college campus, random samples of students are given a field sobriety test. The probability of finding a sample that has  $x$  percentage of students passing is described by

$$\frac{2x}{\sqrt{1+8x}}, \quad (*)$$

where  $x$  is a number between 0 and 1. What is the probability that a tested sample of students has at least 75% passing the sobriety test?