

1 3.3: Rates of Change

Recall: The derivative of a function can measure:

Examples:

A particle moves in a line according to the function $s = f(t) = t^3 - 6t^2 + 9t$, where t is in seconds and s is in feet.

- a) Find the velocity at time t
- b) What is the velocity after 2 seconds?
- c) When is the particle at rest?
- d) Find the total distance traveled in the first 4 seconds.

Sand is dumped into a cylindrical can with a 3 foot diameter.

- a) Find the average rate of change in the volume of the sand from a height of 1 foot to a height of 2 feet.
- b) Find the instantaneous rate of change in the volume of sand when the height is 2 feet.