# Exercise 66

When you turn on a hot-water faucet, the temperature T of the water depends on how long the water has been running.

(a) Sketch a possible graph of T as a function of the time t that has elapsed since the faucet was turned on.

(b) Describe how the rate of change of T with respect to t varies as t increases.

(c) Sketch a graph of the derivative of T.

Solution

Below is a possible graph of the water temperature (arbitrary units) versus elapsed time (in seconds).
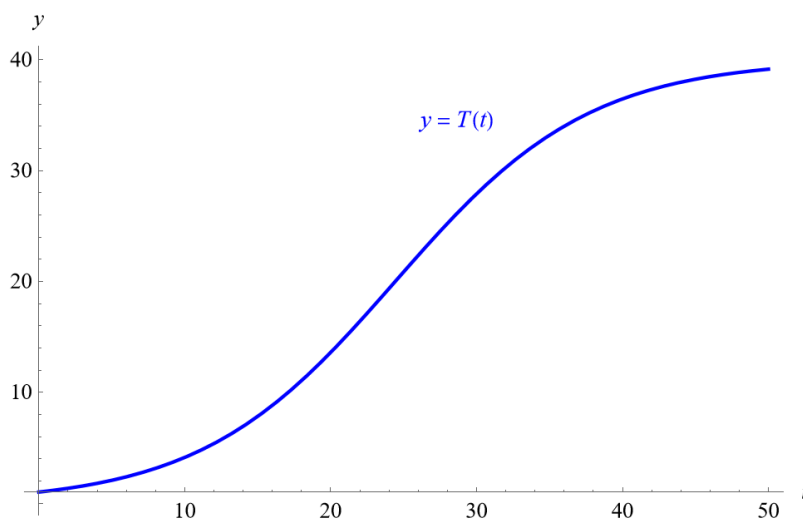
Below is a graph of the rate that the temperature changes with respect to the elapsed time. The change is slow at first, then it changes quickly, then it slows down.