



Examples 7.5 – Differential Equations

1. A cup of coffee at 200°F is allowed to cool in a room with a constant temperature of 75°F . If the temperature of the coffee is 185°F after 3 min, what will the temperature be after 10 min?

Solution:

2. Find the general solution to the differential equation $y'' = 9y$, and then find the constants C_1 and C_2 in the general solution given that $y(0) = 1$ and $y'(0) = 15$.

Solution:

3. A mass attached to a vertical spring has position $y(t)$ meters after t seconds, where y satisfies $y'' = -4y$. Positions below equilibrium and downward motion are considered positive.
 - (a) Find the position function if the initial position is 0.5 m and the initial velocity is 3 m/s.

Solution:

- (b) Find a time at which the mass is at its greatest distance from equilibrium. Use this answer to find the amplitude of the system.

Solution: