

**Problem 10.27:**

27. The equation describing the water height  $h$  in a spherical tank with a drain at the bottom is

$$\pi(2rh - h^2) \frac{dh}{dt} = -C_d A \sqrt{2gh}$$

Suppose that the tank's radius is  $r = 3$  m and the circular drain hole of area  $A$  has a radius of 2 cm. Assume that  $C_d = 0.5$  and that the initial water height is  $h(0) = 5$  m. Use  $g = 9.81$  m/s<sup>2</sup>. Use Simulink to solve the nonlinear equation, and plot the water height as a function of time until  $h(t) = 0$ .



