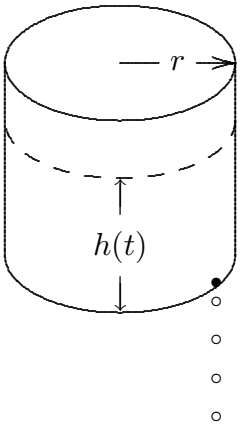
Name:_____

640:244–01 SPRING 2007 Quiz 2 January 31, 2007

1. Find an explicit solution of the initial value problem $y' = (2x + 4)y^2, \quad y(1) = -1/8$. What is the largest interval $\alpha < x < \beta$ (containing the initial point $x = 0$) in which your solution exists?

2. Water leaks out of a small hole in a cylindrical tank at a rate (cubic feet per hour) which is a constant C times the depth (in feet) of water in the tank. The tank has radius r feet.



(a) The depth $h(t)$ of water in the tank at time t satisfies a differential equation $h' = -kh$ for some constant $k > 0$. Find k in terms of the given data.

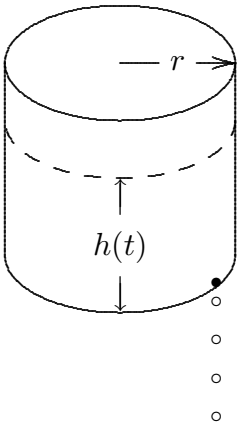
(b) At noon the depth of water is 10 foot, and at 2:00 P.M. it is 8 foot. Find the depth at time t (i.e., t hours after noon). You can assume here the result of (a): $h' = -kh$.

Name:_____

640:244–02 SPRING 2007 Quiz 2 January 31, 2007

1. Find an explicit solution of the initial value problem $y' = (2x+1)y^2, \quad y(0) = 1/2.$ What is the largest interval $\alpha < x < \beta$ (containing the initial point $x = 0$) in which your solution exists?

2. Water leaks out of a small hole in a cylindrical tank at a rate (cubic feet per hour) which is a constant C times the depth (in feet) of water in the tank. The tank has radius r feet.



(a) The depth $h(t)$ of water in the tank at time t satisfies a differential equation $h' = -kh$ for some constant $k > 0$. Find k in terms of the given data.

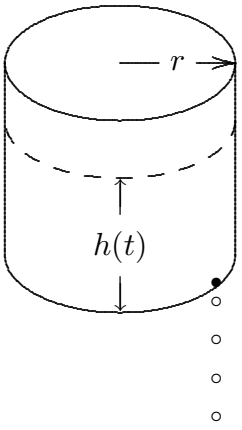
(b) At noon the depth of water is 10 foot, and at 2:00 P.M. it is 8 foot. Find the depth at time t (i.e., t hours after noon). You can assume here the result of (a): $h' = -kh$.

Name:_____

640:244–03 SPRING 2007 Quiz 2 January 31, 2007

1. Find an explicit solution of the initial value problem $y' = (2x+3)y^2, \quad y(0) = 1/4$. What is the largest interval $\alpha < x < \beta$ (containing the initial point $x = 2$) in which your solution exists?

2. Water leaks out of a small hole in a cylindrical tank at a rate (cubic feet per hour) which is a constant C times the depth (in feet) of water in the tank. The tank has radius r feet.



(a) The depth $h(t)$ of water in the tank at time t satisfies a differential equation $h' = -kh$ for some constant $k > 0$. Find k in terms of the given data.

(b) At noon the depth of water is 10 foot, and at 2:00 P.M. it is 8 foot. Find the depth at time t (i.e., t hours after noon). You can assume here the result of (a): $h' = -kh$.