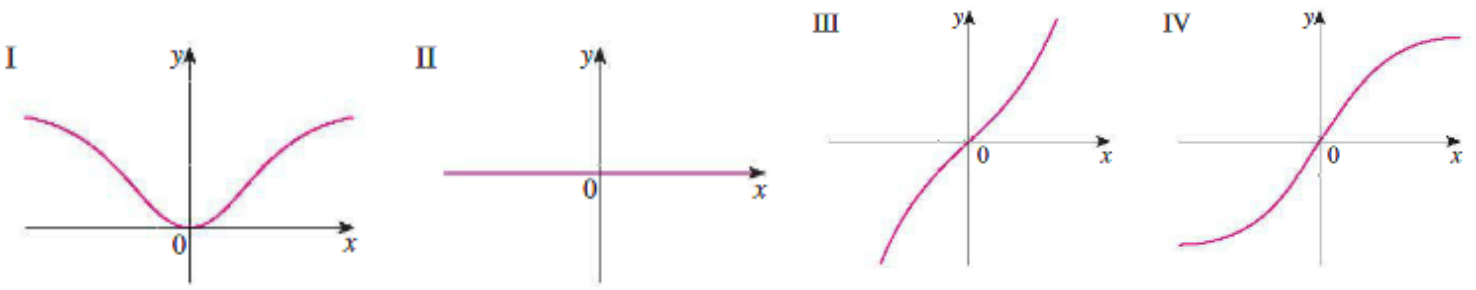
Differential Equations

1. Show for any constant c, that $y = \dfrac{1 + cr^t}{1 - ce^t}$ is a solution to the differential equation $y' = \frac{1}{2}(y^2 - 1)$.

2. Match the differential equations with the solutions graphs labeled I-IV.

   (a) $y' = 1 + x^s + y^2$ (b) $y' = xe^{-x^2-y^2}$

   (c) $y' = \dfrac{1}{1 + e^{x^2+y^2}}$ (d) $y' = \sin(xy)\cos(xy)$



Check your answers on the front page by consulting Example 1 on page 583 and looking at the answer to 13 in §9.1.

3. Consider the differential equation $y' = x + y$.

   (a) Sketch a direction field for the above differential equation.

   (b) Sketch a solution to the above differential equation if you know when $x = 0$ that $y = 1$.