Quiz

Name:_____

1. A blacksmith puts a hot iron horseshoe in a bucket of water. As the horseshoe cools the water heats up. Let $H(t)$ be the temperature of the horseshoe t minutes after it is put into the water and let $W(t)$ be the temperature of the water at the same time. Newtons law of cooling says that the rate of change of the each of $H(t)$ and $W(t)$ are proportional to the difference in the temperatures. Use this to write a system of differential equations for $H(t)$ and $W(t)$.

2. Show that the given function $y(t)$ satisfies the given initial value problem.
(a) $y(t) = 3t^2, \qquad y' = 2ty, \quad y(1) = 3.$

(b) $y(t) = \sin(t), \qquad y' = \sqrt{1 - y^2}, \quad y(0) = 0.$