

Quiz 21

Name: _____

1. Using the stability test, assess the stability of the equilibria for the differential equation

$$\frac{dy}{dx} = y^2 - 1.$$

The equilibria are found from $y^2 - 1 = 0$, giving $y^* = \pm 1$. The updating function is $f(y) = y^2 - 1$, and $f'(y) = 2y$. Since $f'(1) = 2$ is positive, $y^* = 1$ is unstable. Since $f'(-1) = -2$ is negative, $y^* = -1$ is stable.