1.5, ex. 2 By the Existence and Uniqueness Theorem, the solution \( y(t) \) that satisfies \( y(0) = 1 \) has to stay between the solutions \( y_3(t) = 0 \) and \( y_2(t) = 2 \), for all time.

1.5, ex. 6 Since \( y_0(t) \equiv 3 \) is an equilibrium solution, by the Existence and Uniqueness Theorem the solution that satisfies \( y(0) = 3 \) is constant, i.e., \( y(t) \equiv y_0(t) \equiv 3 \).

1.6, ex. 26 The equilibria of

\[
\frac{dy}{dt} = y^2 - 4y + 2
\]

are \( 2 \pm \sqrt{2} \). Since the right-hand side of the equation is positive for \( y = 5 \) and there is no equilibrium greater than 5, the solution satisfying \( y(0) = 5 \) increases and tends to infinity, as \( t \to \infty \).