**Example.** Consider the single-step method

\[ w_n = w_{n-1} + h\phi(t_{n-1}, w_{n-1}, h), \quad n = 1, 2, \ldots \]

corresponding to the ODE \( y' = f(t, y) \). Show that the following single-step methods are stable if \( f(t, y) \) satisfies a Lipschitz condition for the domain \( D = \{(t, y) | a \leq t \leq b, -\infty < y < \infty\} \).

(a) Euler’s method:

\[ \phi(t, w, h) = f(t, w) \]

(b) Explicit trapezoidal method:

\[ \phi(t, w, h) = \frac{1}{2} f(t, w) + \frac{1}{2} f(t + h, w + hf(t, w)) \]