

Additional Practice Exercises on Predictor-Corrector Method

1. Derive the predictor-corrector formula based on Euler's method as the predictor and trapezoidal rule of integration as the corrector.

2. Use the formula developed in 1 to solve the following equations with $h = 0.5$.

(a) $y' = t^2 - y, y(0) = 1, 0 \leq t \leq 2$
(**Exact solution:** $y(t) = -e^{-t} + t^2 - 2t + 2$)

(b) $y' = -\frac{t}{y}, y(1) = 1, 1 \leq t \leq 2$
(**Exact solution:** $y(t) = (2 - t^2)^{\frac{1}{2}}$)

Compare the computed solution at each step with the exact solution.