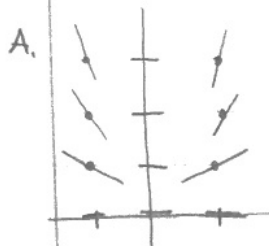


Slope Fields and Euler's Method HW

10. $\frac{dy}{dx} = \frac{xy}{2}$



B. $\frac{dy}{dx} = 2xy + 2y$ (0,3) $y(2)$ $h=0.5$

$x_0 = 0$

$y_0 = 3$

$x_1 = 0.5$

$y_1 = 3 + 0.5(2 \cdot 0 \cdot 3 + 2 \cdot 3) = 6$ (0.5, 6)

$x_2 = 1$

$y_2 = 6 + 0.5(2 \cdot 0.5 \cdot 6 + 2 \cdot 6) = 15$ (1, 15)

$x_3 = 1.5$

$y_3 = 15 + 0.5(2 \cdot 1 \cdot 15 + 2 \cdot 15) = 45$ (1.5, 45)

$x_4 = 2$

$y_4 = 45 + 0.5(2 \cdot 1.5 \cdot 45 + 2 \cdot 45) = 157.5$

B. $f(0) = 3$ $\frac{dy}{dx} = \frac{xy}{2}$

$h = 0.1$

Find $f(0.2)$

$x_0 = 0$ $y_0 = 3$

$x_1 = 0.1$ $y_1 = 3 + 0.1(\frac{0}{2}) = 3$

$x_2 = 0.2$ $y_2 = 3 + 0.1(\frac{3 \cdot 0.1}{2}) = 3.015$

$y(2) \approx 157.5$

C. omit

11.

A. $\frac{dy}{dx} = 2x\sqrt{y}$ $y(0) = 2$ $h = 0.2$

$x_0 = 0$ $y_0 = 2$

$x_1 = 0.2$ $y_1 = 2 + 0.2(\frac{2 \cdot 0}{2}) = 2$ (0.2, 2)

$x_2 = 0.4$ $y_2 = 2 + 0.2(\frac{2 \cdot 0.2}{2}) = 2.04$ (0.4, 2.04)

$x_3 = 0.6$ $y_3 = 2.04 + 0.2(\frac{2 \cdot 0.4}{2.04}) = 2.11843$ (0.6, 2.11843)

$x_4 = 0.8$ $y_4 = 2.11843 + 0.2(\frac{2 \cdot 0.6}{2.11843}) = 2.231$

B. omit

12.

A. $\frac{dy}{dx} = -2y$ $y(0) = 4$ $h = 0.1$

$x_0 = 0$ $y_0 = 4$

$x_1 = 0.1$ $y_1 = 4 + 0.1(-2(4)) = 3.2$

$x_2 = 0.2$ $y_2 = 3.2 + 0.1(-2 \cdot 3.2) = 2.56$

$x_3 = 0.3$ $y_3 = 2.56 + 0.1(-2 \cdot 2.56) = 2.048$

B. omit