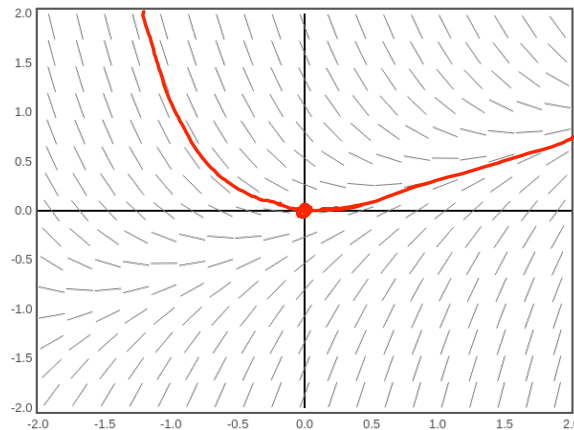


PRINT your name:

SOLUTION

1. For the differential equation $y' = x - 2y$ with slope field shown below, sketch the solution with $y(0) = 0$.



2. Use Euler's method with stepsize $h = 0.1$ to estimate $y(.3)$ for the differential equation $y' = x - 2y$ with $y(0) = 0$.

WE START WITH THE KNOWN VALUE $y(0) = 0$.

$$x_0 = 0 \quad y_0 = 0 \quad y'(x_0, y_0) = 0 - 2 \cdot 0 = 0$$

$$x_1 = x_0 + h = 0.1, \quad y_1 = y_0 + h \cdot y'(x_0, y_0) \quad y'(.1, 0) = .1 - 2 \cdot 0 = .1 \\ = 0 + .1 \times 0 = 0$$

$$x_2 = 0.2 \quad y_2 = 0 + .1 \times .1 = .01 \quad y'(.2, .01) = .2 - 2 \times .01 = .18$$

$$x_3 = 0.3 \quad y_3 = .01 + .1 \times .18 = .028$$

SO EULER GIVES
WITH $h = .1$

$$y(.3) \approx .028$$