

Lesson 7.4: Euler's Method

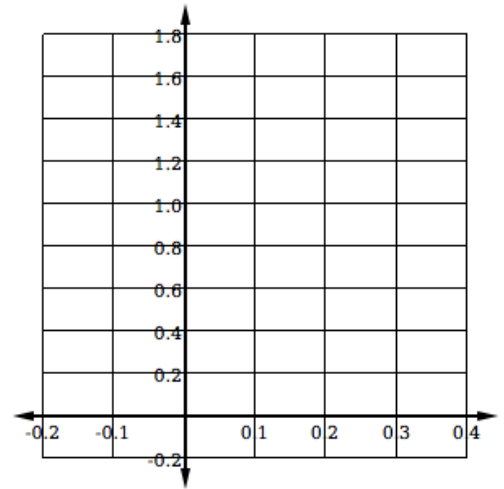
Euler's Method

Euler's Method is a more _____ method of graphing an _____ to a differential equation.

Examples:

- Use Euler's method to construct an approximate solution for the differential equation $\frac{dy}{dx} = y$. Start at the point $(0, 1)$ and use step size $\Delta x = 0.1$.

x	y	$\frac{dy}{dx}$	$\Delta y = (\text{slope})\Delta x$



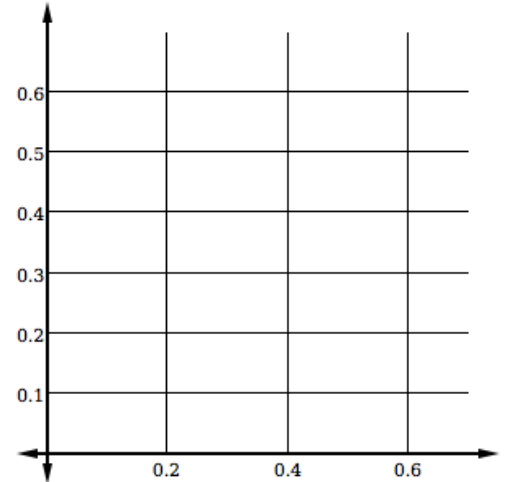
$$y(.3) \approx \underline{\hspace{2cm}}$$

- Solve $\frac{dy}{dx} = y$ algebraically. Fill in the table with the actual values of y .

x	y
0	1
0.1	
0.2	
0.3	

3. Use Euler's Method to approximate the particular solution of the differential equation $y' = x - y$ passing through the point $(0, 0.5)$. Let $\Delta x = 0.2$ and do three steps ($n = 3$). Graph the points.

x	y	$\frac{dy}{dx}$	$\Delta y = (slope)\Delta x$



$y(0.6) \approx$ _____

4. Sketch a particular solution to the differential equation $y' = x - y$ passing through the point $(0, 0.5)$ using the slope field given. Do the two graphs coincide?

