

## Answer on Question #60836 – Math – Algorithms | Quantitative Methods

### Question

b) Solve the IVP, ; )4(y 4

x 4y

1

y

2

=

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' = using Euler's method. Find )2.4(y with h = 2.0  
and 1.0 and extrapolate the value )

### Solution

By Euler's method

$$y_{n+1} = y_n + f(x_n, y_n) \cdot h,$$

where

$$f = y' = \frac{1}{x^2 - 4y}, \quad h = x_{n+1} - x_n$$

We have starting points  $y(4) = 4$ :

$$y_0 = 4, x_0 = 4.$$

Let's find first approximation:

$$f(x_0, y_0) = \frac{1}{16 - 16} = [\infty]$$

So we cannot solve the IVP by Euler's method, because  $f(x, y)$  at first approximation is infinity.