

Numerical Methods for DE's

Question: 1.

Let $\frac{dy}{dx} = \sqrt{x^3 + 1}$ and $(x_0, y_0) = (3, 0)$. Using Euler's Method with a step size of 0.1, the value of y_2 correct to two decimal places, is:

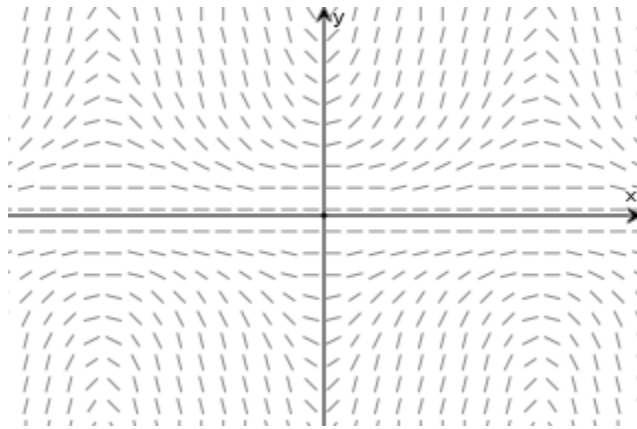
- A. 1.07 B. 1.08 C. 0.53 D. 1.67 E. 1.68

Question: 2.

Let $\frac{dy}{dx} = y \cos(x)$, where $y(2) = y_0 = 3$. Using Euler's method with a step size of 0.1, the value of $y(1.7) = y_3$ correct to 3 decimal places is:

- A. 2.569 B. 2.730 C. 3.226 D. 3.299 E. 3.342

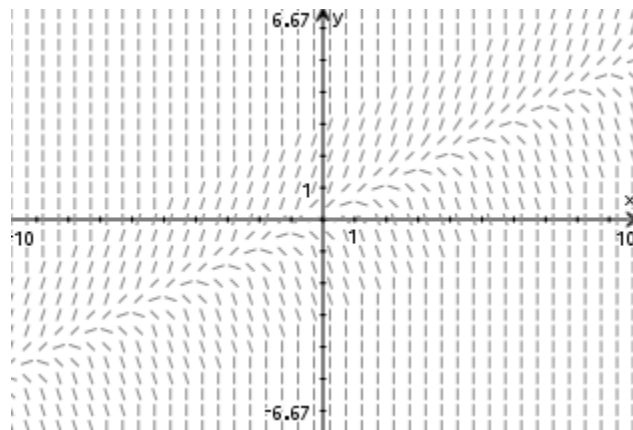
Question: 3.



The direction (slope) field of a first-order differential equation is shown above. The differential equation could be

- $\frac{dy}{dx} = y \sin(3x)$
- $\frac{dy}{dx} = -y \cos(3x)$
- $\frac{dy}{dx} = y^2 \sin(x)$
- $\frac{dy}{dx} = -y^2 \cos(x)$
- $\frac{dy}{dx} = x \sin(y^2)$

Question: 4.

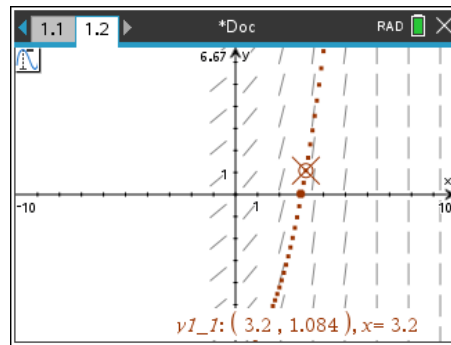
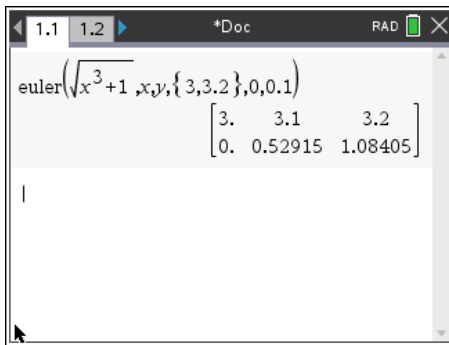


The direction (slope) field for the differential equation $\frac{dy}{dx} = 2y - x$ is shown above. A solution of this differential equation that includes $(-2, 0)$ could also include:

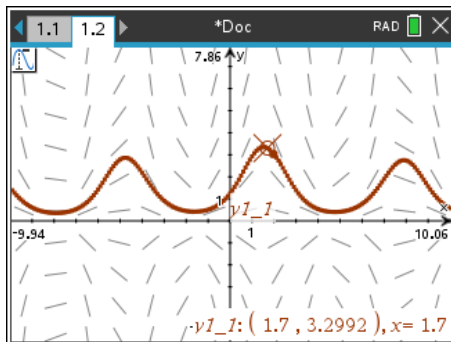
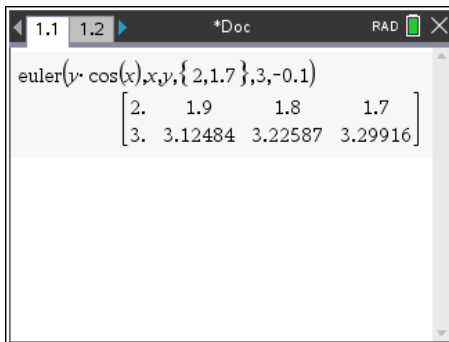
- a. $(-0.9, 0.1)$
- b. $(-1.8, 0.43)$
- c. $(-3.1, 0.5)$
- d. $(-2.5, -1)$
- e. $(-2.8, 2.09)$

Answers

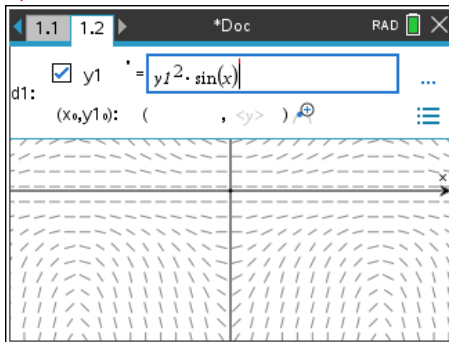
Question 1 Option B



Question 2 Option D



Question 3 Answer C



Question 4 Answer B

