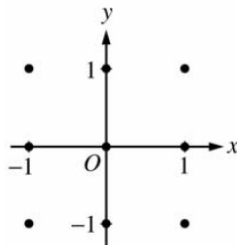


Consider the differential equation $\frac{dy}{dx} = (y - 1)^2 \cos(\pi x)$.

- (a) On the axes provided, sketch a slope field for the given differential equation at the nine points indicated.
 (Note: Use the axes provided in the exam booklet.)



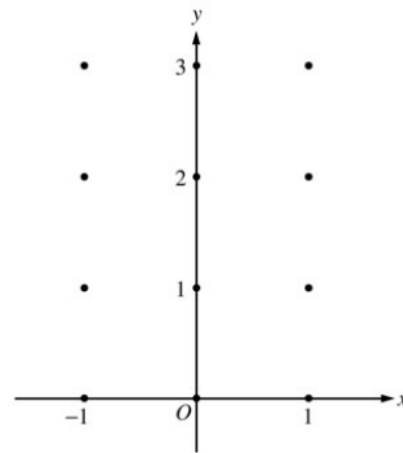
- (b) There is a horizontal line with equation $y = c$ that satisfies this differential equation. Find the value of c .
 (c) Find the particular solution $y = f(x)$ to the differential equation with the initial condition $f(1) = 0$.

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Question 5

Consider the differential equation $\frac{dy}{dx} = x^4(y - 2)$.

- (a) On the axes provided, sketch a slope field for the given differential equation at the twelve points indicated.
 (Note: Use the axes provided in the test booklet.)
 (b) While the slope field in part (a) is drawn at only twelve points, it is defined at every point in the xy -plane. Describe all points in the xy -plane for which the slopes are negative.
 (c) Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(0) = 0$.



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Question 6

Consider the differential equation $\frac{dy}{dx} = \frac{-xy^2}{2}$. Let

$y = f(x)$ be the particular solution to this differential equation with the initial condition $f(-1) = 2$.

- (a) On the axes provided, sketch a slope field for the given differential equation at the twelve points indicated.
 (Note: Use the axes provided in the test booklet.)

- (b) Write an equation for the line tangent to the graph of f at $x = -1$.

- (c) Find the solution $y = f(x)$ to the given differential equation with the initial condition $f(-1) = 2$.

