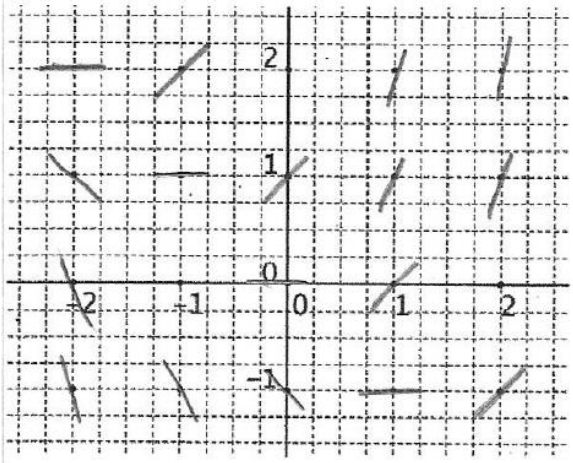
AP Calculus BC – Worksheet 97

Differential Equations and Slope Fields

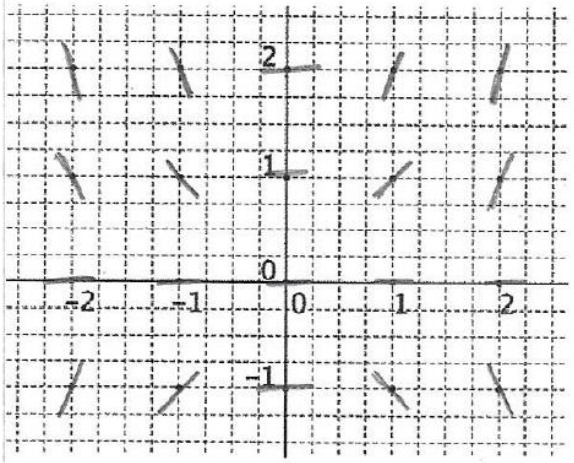
1. $\frac{dy}{dx} = x + y$

Point	Slope	Point	Slope
(-2, -1)		(0, 1)	
(-2, 0)		(0, 2)	
(-2, 1)		(1, -1)	
(-2, 2)		(1, 0)	
(-1, -1)		(1, 1)	
(-1, 0)		(1, 2)	
(-1, 1)		(2, -1)	
(-1, 2)		(2, 0)	
(0, -1)		(2, 1)	
(0, 0)		(2, 2)	



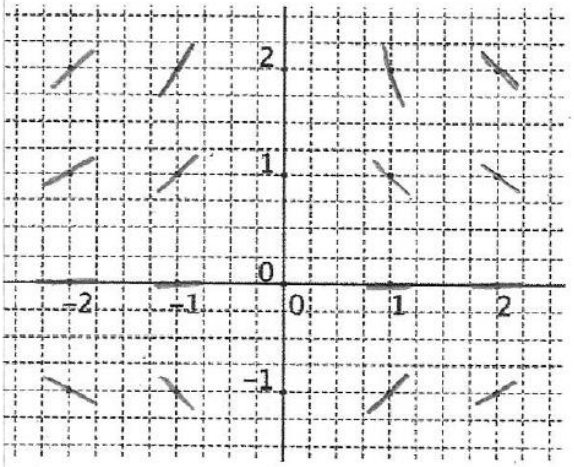
2. $\frac{dy}{dx} = xy$

Point	Slope	Point	Slope
(-2, -1)		(0, 1)	
(-2, 0)		(0, 2)	
(-2, 1)		(1, -1)	
(-2, 2)		(1, 0)	
(-1, -1)		(1, 1)	
(-1, 0)		(1, 2)	
(-1, 1)		(2, -1)	
(-1, 2)		(2, 0)	
(0, -1)		(2, 1)	
(0, 0)		(2, 2)	



3. $\frac{dy}{dx} = -y/x$

Point	Slope	Point	Slope
(-2, -1)		(0, 1)	
(-2, 0)		(0, 2)	
(-2, 1)		(1, -1)	
(-2, 2)		(1, 0)	
(-1, -1)		(1, 1)	
(-1, 0)		(1, 2)	
(-1, 1)		(2, -1)	
(-1, 2)		(2, 0)	
(0, -1)		(2, 1)	
(0, 0)		(2, 2)	



Match the differential equations with the appropriate slope field. For each graph sketch the particular solution that passes through the point $(0,1)$.

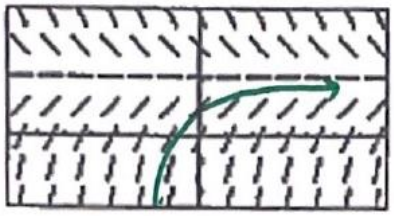
4. $\frac{dy}{dx} = \sin x$ C

5. $\frac{dy}{dx} = x - y$ D

6. $\frac{dy}{dx} = 2 - y$ A

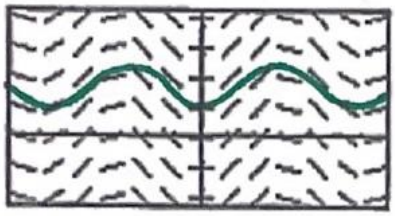
7. $\frac{dy}{dx} = x$ B

(A)

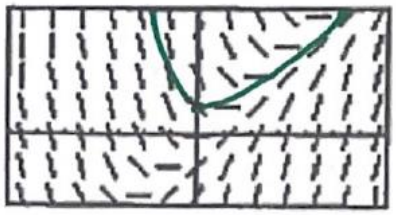


(B)

(C)



(D)



Match the differential equations with the appropriate slope field. For each graph sketch the particular solution that passes through the point $(-1,-1)$.

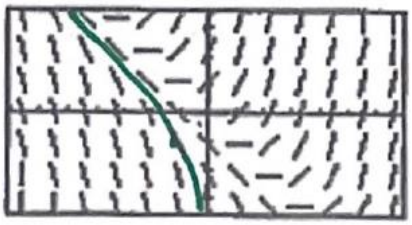
8. $\frac{dy}{dx} = 0.5x - 1$ B

9. $\frac{dy}{dx} = 0.5y$ C

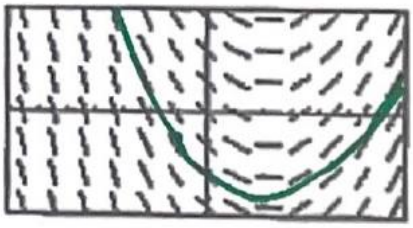
10. $\frac{dy}{dx} = -\frac{x}{y}$ D

11. $\frac{dy}{dx} = x + y$ A

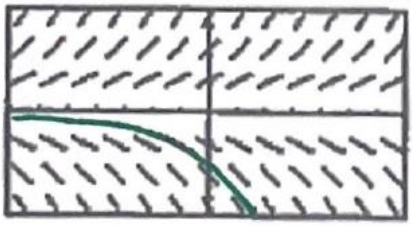
(A)



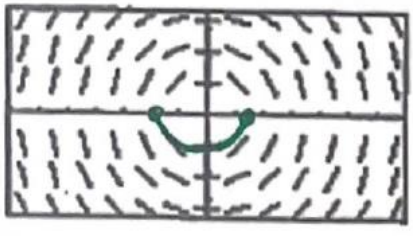
(B)



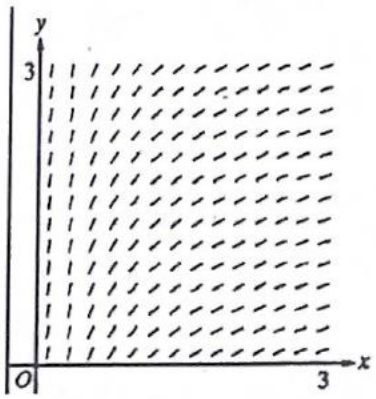
(C)



(D)



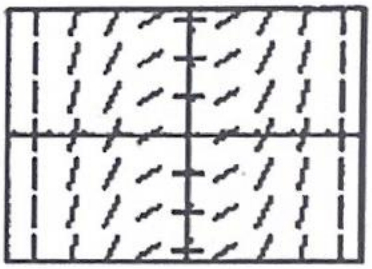
12. At the right is a slope field from a certain differential equation. Which of the following could be a specific solution to that differential equation?



(A) $y = x^2$ (B) $y = e^x$ (C) $y = e^{-x}$

(D) $y = \cos x$ (E) $y = \ln x$

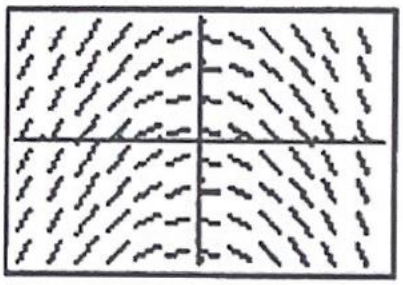
13. At the right is a slope field from a certain differential equation. Which of the following could be a specific solution to that differential equation?



(A) $y = \sin x$ (B) $y = \cos x$ (C) $y = x^2$

(D) $y = \frac{1}{6}x^3$ (E) $y = \ln x$

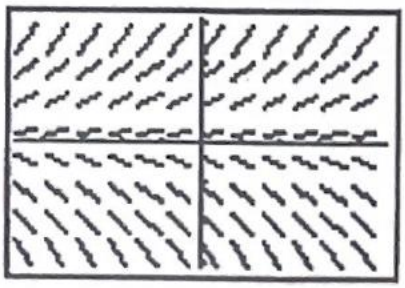
14. At the right is a slope field from a certain differential equation. Which of the following could be a specific solution to that differential equation?



(A) $y = \sin x$ (B) $y = \cos x$ (C) $y = -x^2$

(D) $y = \tan x$ (E) $y = e^{-x}$

15. At the right is a slope field from a certain differential equation. Which of the following could be a specific solution to that differential equation?



(A) $y = x^2$ (B) $y = e^x$ (C) $y = e^{-x}$

(D) $x = y^2$ (E) $y = \ln x$