

5 for 5: Slope Fields and Differential Equations

1. Which of the following is the solution to the differential equation  $\frac{dy}{dx} = 3y^2$  with the initial condition  $y(0) = 3$ ?

(A)  $y = \sqrt{9e^{3x}}$

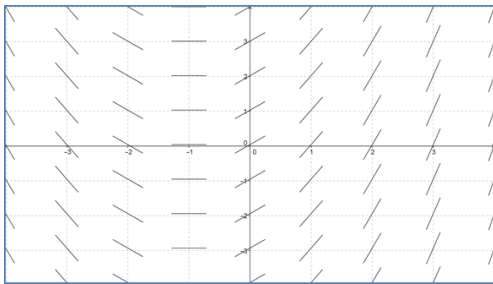
(B)  $y = \sqrt{\frac{1}{9}e^{3x}}$

(C)  $y = \frac{3}{1-9x}$

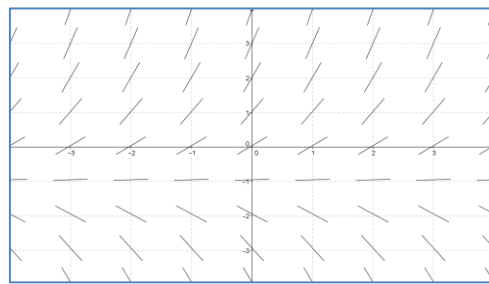
(D)  $y = \frac{3}{9x-1}$

2. Which of the following represents a slope field for the differential equation  $\frac{dy}{dx} = \frac{y}{x^2}$ ?

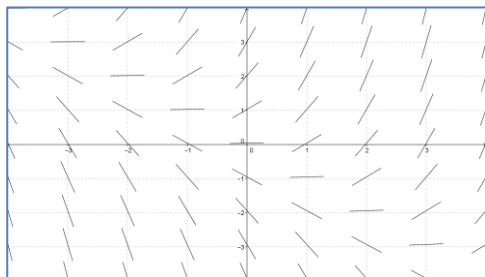
a.



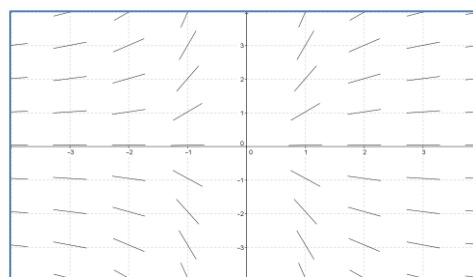
b.

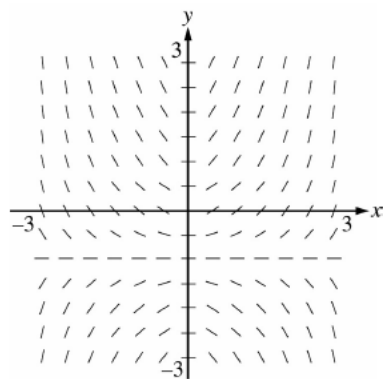


c.



d.





3. Shown above is a slope field for which of the following differential equations?
- $\frac{dy}{dx} = x(y + 1)$
  - $\frac{dy}{dx} = y(x + 1)$
  - $\frac{dy}{dx} = (x + 1)^2$
  - $\frac{dy}{dx} = y + 1$
4. Which of the following is the solution to the differential equation  $\frac{dy}{dx} = e^{x-y}$  with the initial condition  $y(0) = \ln 3$ ?
- $y = -x + \ln 3$
  - $y = x + \ln 3$
  - $y = -\ln(e^x + 2)$
  - $y = \ln(e^x + 2)$
5. The function  $y = e^{2x} - 3x + 4$  is a solution to which of the following differential equations?
- $y'' - y' + 6 = 0$
  - $y'' - 2y' - 6 = 0$
  - $y'' - y' + 3 = 0$
  - $2y'' - y' + 3 = 0$