

## 7.7 Separation of Variables (Particular Solutions)

Calculus

Name: \_\_\_\_\_

CA #2

For each differential equation, find the solution that passes through the given initial condition.

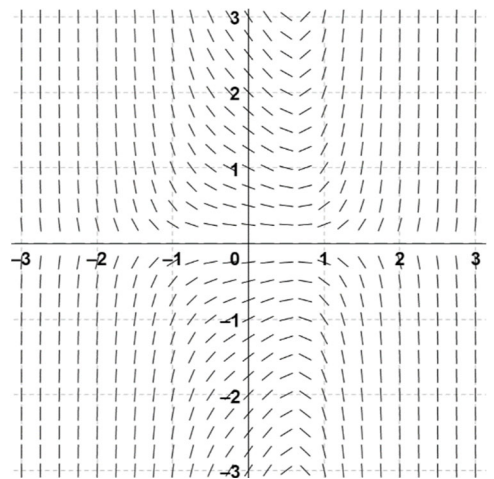
1.  $\frac{dy}{dx} = (y - 2)^2 \sin(\pi x)$   $f\left(\frac{1}{2}\right) = 3$

2.  $\frac{dy}{dx} = e^y(2x - 5)$   $f(2) = 0$

3.  $\frac{dy}{dx} = \frac{3-y}{x}$   $f(4) = 2$

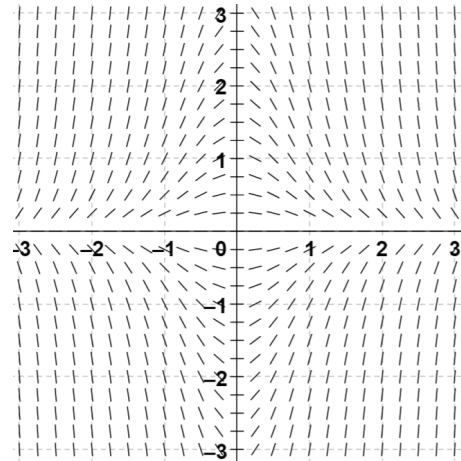
4.  $\frac{dy}{dx} = \frac{4x^3-1}{2y}$   $f(1) = -2$

5. The slope field of  $\frac{dy}{dx} = \frac{4x^3-1}{2y}$  from question #4 is shown. Draw the particular solution  $y = f(x)$  when  $f(1) = -2$  that you found in question #4 on the slope field.

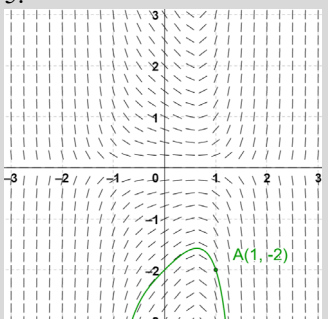
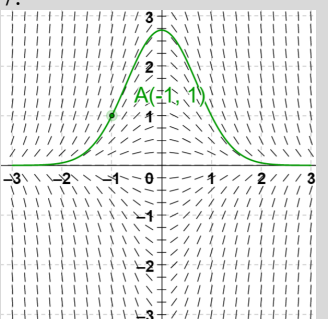


6.  $\frac{dy}{dx} = -2xy$   $f(-1) = 1$

7. The slope field of  $\frac{dy}{dx} = -2xy$  from question #6 is shown below. Draw the particular solution  $y = f(x)$  when  $f(-1) = 1$  that you found in question #6 on the slope field.



Answers to 7.7 CA #2

|   |   |   |                              |
|---|---|---|------------------------------|
| 1. $y = \frac{1}{\frac{1}{\pi} \cos(\pi x) + 1} + 2$  | 2. $y = -\ln(-x^2 + 5x - 5)$                        | 3. $y = -\frac{4}{x} + 3$   | 4. $y = -\sqrt{x^4 - x + 4}$ |
| <p>5.</p>  | <p>6. <math>y = e^1 e^{-x^2} = e^{1-x^2}</math></p> | <p>7.</p>  |                              |