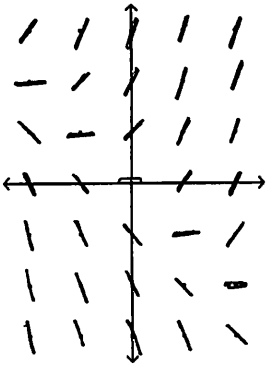
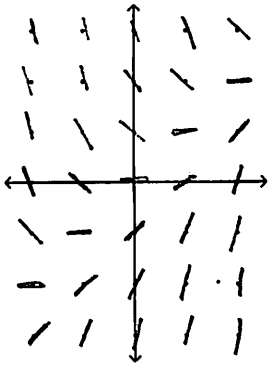
Draw the slope field at the indicated points.

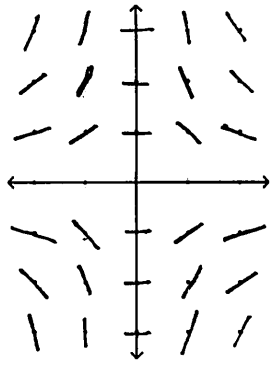
32. $\frac{dy}{dx} = x + y$



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

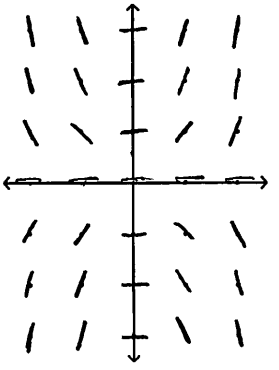


34. $\frac{dy}{dx} = -\frac{y}{x}$

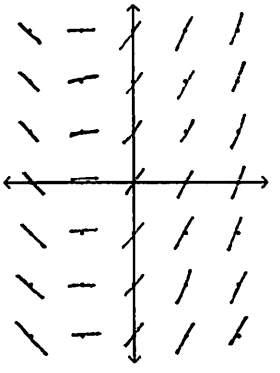


Draw the slope field at the indicated points.

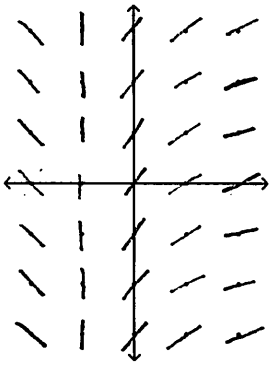
35. $\frac{dy}{dx} = xy$



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

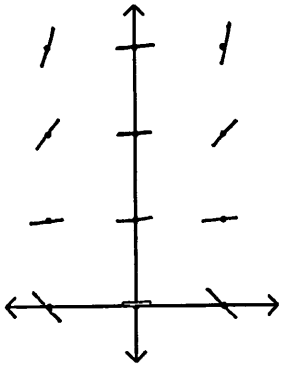


37. $\frac{dy}{dx} = \frac{1}{x+1}$



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

(a) Sketch a slope field for $\frac{dy}{dx}$ at the twelve points indicated.

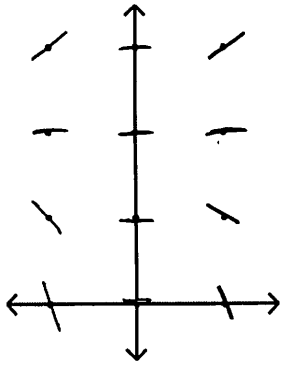


(b) While the slope field in part (a) is drawn only at 12 points, it is defined at every point in the xy-plane. Describe all points in the xy-plane for which the slopes are positive.

(c) Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(0) = 3$.

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

(a) Sketch a slope field for $\frac{dy}{dx}$ at the twelve points indicated.



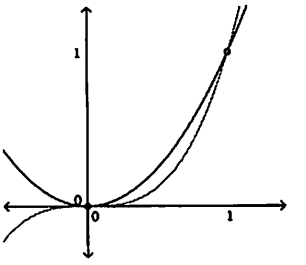
(b) While the slope field in part (a) is drawn only at 12 points, it is defined at every point in the xy-plane. Describe all points in the xy-plane for which the slopes are negative.

(c) Find the particular solution $y = f(x)$ to the given differential equation with the initial condition $f(0) = 0$.

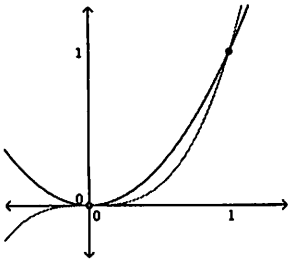
Find the area of each bounded region using both a vertical and a horizontal cross-section.

40. Find the area of the region bounded by $y = x^2$ and $y = x^3$.

(a) vertical cross-section:

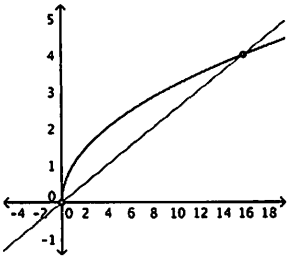


(b) horizontal cross-section:

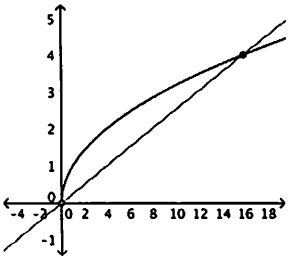


41. Find the area of the region bounded by $y = \sqrt{x}$ and $y = \frac{1}{4}x$.

(a) vertical cross-section:



(b) horizontal cross-section:



38. b) $y > 1$

c) $\frac{dy}{dx} = x^2(y-1)$; $(0,3)$

$$\int \frac{1}{y-1}\,dy = \int x^2\,dx$$

$$\ln|y-1| = \frac{x^3}{3} + C$$

$$y-1 = Ce^{x^3/3}$$

$$y = 1 + Ce^{x^3/3}$$

$$3 = 1 + C \Rightarrow C = 2$$

$$\boxed{y = 1 + 2e^{x^3/3}}$$

39. b) $y - 2 < 0$

$y < 2$

c) $\frac{dy}{dx} = x^4(y-2)$; $(0,0)$

$$\int \frac{1}{y-2} = \int x^4\,dx$$

$$\ln|y-2| = \frac{x^5}{5} + C$$

$$y-2 = Ce^{x^5/5}$$

$$y = 2 + Ce^{x^5/5}$$

$$0 = 2 + C \Rightarrow C = -2$$

$$\boxed{y = 2 - 2e^{x^5/5}}$$