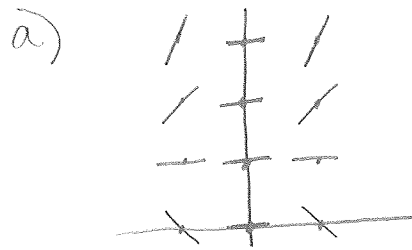


Review of Slope Fields Answer Key

2004 #6 $\frac{dy}{dx} = x^2(y-1)$



b) $x^2(y-1) > 0$
 $x^2 > 0$
 $x \neq 0$
 $y-1 > 0$
 $y > 1$

All points where $x \neq 0$ and $y > 1$

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

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

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

$y-1 = \pm Ce^{\frac{1}{3}x^3}$

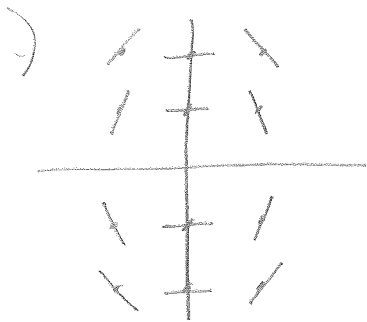
$y = \pm Ce^{\frac{1}{3}x^3} + 1$

$3 = \pm Ce^0 + 1$

$2 = \pm C$

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

2005 #6 $\frac{dy}{dx} = -\frac{2x}{y}$



b) point = (1, -1) slope = $\frac{-2(1)}{-1} = 2$

$y+1 = 2(x-1)$

$y+1 = 2(1.1-1)$

$y+1 = .2$

$y = -.8$ so $f(1.1) \approx -.8$

c) $\int y dy = \int -2x dx$

$\frac{1}{2}y^2 = -x^2 + C$

$y^2 = -2x^2 + 2C$

$(-1)^2 = -2(1)^2 + 2C$

$1 = -2 + 2C$

$3 = 2C$

$\frac{3}{2} = C$

$y^2 = -2x^2 + 2\left(\frac{3}{2}\right)$

$y^2 = -2x^2 + 3$

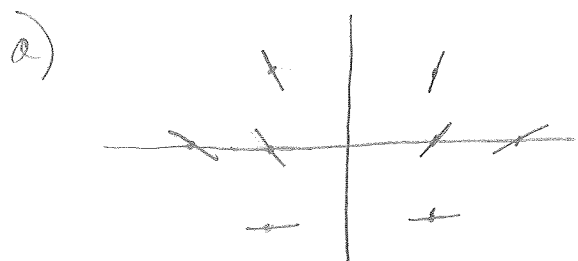
$y = \pm \sqrt{-2x^2 + 3}$

↑ can't have this if y is a function

$y = -\sqrt{-2x^2 + 3}$

↑ because the point (1, -1) is on the function

2006 #5 $\frac{dy}{dx} = \frac{1+y}{x}, x \neq 0$



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

$$\ln|1+y| = \ln|x| + C$$

$$|1+y| = e^{\ln|x|+C} = Ce^{\ln|x|} = C|x|$$

$$1+y = \pm C|x|$$

$$y = \pm C|x| - 1$$

$$1 = \pm C|-1| - 1$$

$$2 = \pm C$$

$$y = 2|x| - 1$$

The domain is $(-\infty, 0)$ because this is the largest open interval containing the point $(-1, 1)$.