

Calculus Chapter 4 Review Day 2

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35)

$$x \frac{dy}{dx} + 1y + 2 + 3 \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-y-2}{x+3}$$

36)

$$4x^{-1/5} + 12y^{1/5} \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-4x^{-1/5}}{12y^{1/5}}$$

37)

$$\frac{1}{2}(xy)^{-1/2} \left(1y + x \frac{dy}{dx} \right) = 0$$

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

38)

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

$$\frac{dy}{dx} = \frac{1}{2y(x+1)^2}$$

39)

$$3x^2 + 3y^2 \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-3x^2}{3y^2} = \frac{-x^2}{y^2}$$

$$\frac{d^2y}{dx^2} = \frac{(y^2)(-2x) - (-x^2) \left(2y \frac{dy}{dx} \right)}{(y^2)^2}$$

$$\frac{d^2y}{dx^2} = \frac{(y^2)(-2x) - (-x^2) \left(2y \left(\frac{-x^2}{y^2} \right) \right)}{y^4}$$

40)

$$2y \frac{dy}{dx} = \frac{2}{x^2}$$

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

$$\frac{d^2y}{dx^2} = x^{-2}(-y^{-2}) \frac{dy}{dx} + (-2x^{-3})y^{-1}$$

$$\frac{d^2y}{dx^2} = x^{-2}(-y^{-2})(x^{-2}y^{-1}) + (-2x^{-3})y^{-1}$$

41)

$$3y^2 \frac{dy}{dx} + \frac{dy}{dx} = -2 \sin x$$

$$\frac{dy}{dx} = \frac{-2 \sin x}{3y^2 + 1}$$

$$\frac{d^2 y}{dx^2} = \frac{(3y^2 + 1)(-2 \cos x) - (-2 \sin x) \left(6y \frac{dy}{dx} \right)}{(3y^2 + 1)^2}$$

$$\frac{d^2 y}{dx^2} = \frac{(3y^2 + 1)(-2 \cos x) - (-2 \sin x) \left(6y \left(\frac{-2 \sin x}{3y^2 + 1} \right) \right)}{(3y^2 + 1)^2}$$

42)

$$\frac{1}{3} x^{-2/3} + \frac{1}{3} y^{-2/3} \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-y^{2/3}}{x^{2/3}}$$

$$\frac{d^2 y}{dx^2} = \frac{x^{2/3} \left(-\frac{2}{3} y^{-1/3} \frac{dy}{dx} \right) - (-y^{2/3}) \left(\frac{2}{3} x^{-1/3} \right)}{x^{4/3}}$$

$$\frac{d^2 y}{dx^2} = \frac{x^{2/3} \left(-\frac{2}{3} y^{-1/3} \left(\frac{-y^{2/3}}{x^{2/3}} \right) \right) - (-y^{2/3}) \left(\frac{2}{3} x^{-1/3} \right)}{x^{4/3}}$$