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)

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

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

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

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

40)

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

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

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

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

41)

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

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

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

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

42)

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

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

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

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