

11:00
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vi) $y = \frac{\sin 2x}{e^{3x}}$

b) $y = \sin 2x$

~~$y' = \sin 2x$
 $y'' = \cos 2x$
 $y''' = -\sin 2x$
 $y^{(4)} = -\cos 2x$~~

$$\begin{aligned} y' &= \cos 2x \\ y'' &= -\sin 2x \\ y''' &= -\cos 2x \\ y^{(4)} &= \sin 2x \end{aligned}$$

c) $z = x^5 + 3x^3y^2 + 4y^5$

$$\frac{\partial z}{\partial x} = 5x^4 + 6xy^2$$

$$\frac{\partial^2 z}{\partial x^2} = 20x^3 + 6y^2$$

$$\frac{\partial^2 z}{\partial y \partial x} = 3x^2y$$

$$\frac{\partial z}{\partial y} = 6x^3y + 20y^4$$

$$\frac{\partial^2 z}{\partial y^2} =$$

$$= 6x^3 + 80y^3$$

$$\frac{\partial^2 z}{\partial x \partial y} = 3x^2y$$

d) $y = 3x^2 + 16x + 30$

$$y = 2x^2 + 4x + 3$$

$$y =$$

$$0 = x^2 + 12x + 27$$

$$0 = (x+3)(x+9)$$

$$x = -3$$

$$x = -9$$