

Cheat method

$$e^t = 1 + t + \frac{t^2}{2} + \frac{t^3}{6} + \dots$$

$$\cos(t) = 1 - \frac{t^2}{2} + \frac{t^4}{4!} + \dots$$

$$\sin(t) = t - \frac{t^3}{3!} + \frac{t^5}{5!} + \dots$$

$$2 \left( 1 - \frac{x^2}{2} \right)$$

$$2 - x^2$$

$$x - xy^2 + 2 - x^2$$

1).  $F(x, y) = (e^{x^2+2y}, x - xy^2 + 2 \cos(x), 1 - x \sin(x+y))$  near the origin  $P = (0, 0)$

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

$$1 - x^2 + xy$$

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

$$x^2 + 2y$$

$$x^2 \quad x^4 \quad 2yx^2$$

$$1 + \cancel{2x^2} + 2y + \frac{x^4 + 4yx^2 + 4y^2}{2}$$

$$2y \quad 2yx^2 \quad 4y^2$$

$$F = (1 + 2y + x^2 + 2y^2, 2 + x - x^2, 1 - x^2 - xy)$$

deg(3) approximation

$$F_{\deg(3)} = \left( 1 + 2y + x^2 + 2y^2 + 2x^2y + \frac{4}{3}y^3, 2 + x - x^2 - xy^2, 1 - x^2 - xy \right)$$

Quiz 7-M427L

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