82. The gas law for a fixed mass m of an ideal gas at absolute temperature T, pressure P, and volume V is $PV = mRT$, where R is the gas constant. Show that

$$\frac{\partial P}{\partial V}\frac{\partial V}{\partial T}\frac{\partial T}{\partial P} = -1$$

dy Δy

$\frac{\partial P}{\partial V}$: $PV = mRT$

$\frac{\partial P}{\partial V} V + P = 0$

etc

$P = \frac{mRT}{V}$

$\frac{\partial P}{\partial V} = -\frac{mRT}{V^2}$

$\frac{\partial P}{\partial V} V = -P$

$\frac{\partial P}{\partial V} = -\frac{P}{V} = -\frac{\frac{mRT}{V}}{V} = -\frac{mRT}{V^2}$

other questions

14.4 Maple has a lot of nice nuggets.

arrow will put an arrow in space

TNB frame

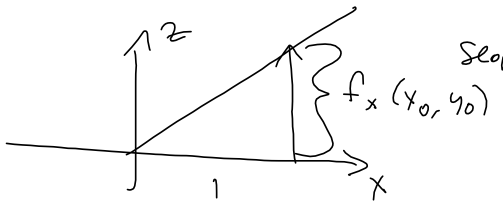
$(e^{-xy/10})(\sqrt{x} + \sqrt{y} + \sqrt{xy})$

find P_{tan} @ $(1, 1, 3e^{-0.1})$

Tangent Plane in vector form   Correction from Wednesday

$$z = \langle x_0, y_0, z_0 \rangle + t\langle 1, 0, f_x(x_0, y_0) \rangle + s\langle 0, 1, f_y(x_0, z_0) \rangle$$

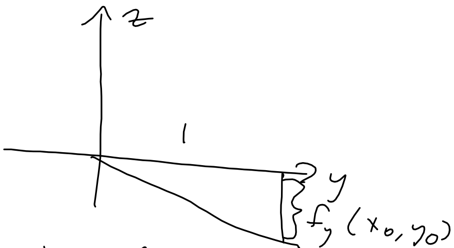
↳ $\langle x_0, y_0, f(x_0, y_0) \rangle$



Slope $= f_x$

In the plane $y = 1$ (for our example)

In general in the plane $y = y_0$



in the plane $x = x_0$