Multivariable Calc 2

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1. shit

2. (a)

$$T(x,y,z) = x^2 + 2y^2 - 3z + 1$$
$$\Delta T =< 2x, 4y, -3 >$$

3.

$$f(x,y) = e^{2x-y-2} + y + sin(x-1) \quad x(t) = cos(5t), y(t) = sin(5t)$$
$$f(x(t),y(t)) = e^{2cos(5t)-sin(5t)-2} + y + sin(cos(5t) - 1)$$

4.

$$f(x,y) = xy + x + 2y \quad g(x,y) = xy - 4$$
$$\Delta f =< y+1, x+2 > \quad \Delta g =< y, x >$$
$$\frac{y+1}{y} = \frac{x+2}{x} \rightarrow x = 2y$$
$$2y^2 = 4 \rightarrow y = \sqrt{2}, x = 2\sqrt{2}$$