Recall the fund. thm. of calc.:

$$\frac{d}{dx}\left(\int_a^{u(x)} f(t)\,dt\right) = \frac{d}{dx}\left(F(t)\Big|_a^{u(x)}\right)$$

$$= \frac{d}{dx}\left(F(u(x)) - F(a)\right)$$

$$= F'(u(x)) \cdot u'(x) - 0$$

$$= f(u(x)) \cdot u'(x)$$

So to compute ∇f for $f(x,y) = \int_{x^2}^{2} (1-t)\,dt$

you get: $f_x = (1-x^2)\cdot 2x$

$f_y = 0$