

## HW23

① If  $\vec{r} = \langle t^3 - t, t^5 + t + 1 \rangle$   
and  $z = x^2 y^3 + 3x + 4y$ , then

$$\frac{dz}{dt} = ? \quad \text{at } t = 1?$$

② Assume a particle is moving such that  
it is always on the surface

$$z = (x^2 + y^4)^{1/2}$$

a) At  $(x, y) = (6, 1)$ ,  $\frac{dx}{dt} = -3 = \frac{dy}{dt} \Rightarrow \frac{dz}{dt} = ?$

b) At  $(x, y) = (-1, 2)$ ,  $\frac{dz}{dt} = 5 = \frac{dy}{dt} \Rightarrow \frac{dx}{dt} = ?$