

MATH 253 – WORKSHEET 15
DIRECTIONAL DERIVATIVES

- (1) An ant is crawling along the curve $y = x^2$ at the rate of v cm/s (distances are measured in cm). The temperature in the xy plane is varying according to $T(x, y) = \frac{y}{1+x^2}$. What is the rate of change of the temperature the ant sees when it is located at (x, y) ?

- (2) Show that every plane tangent to the surface $z^2 = x^2 + y^2$ passes through the origin.