

(1) [7 points] If $z^2 = x^2 + y^2$, $dx/dt = 2$, and $dy/dt = 3$, find dz/dt when $x = 5$ and $y = 12$.

(2) [8 points] Two sides of a triangle are 4 and 5 m in length and the angle between them is increasing at a rate of $3/50$ rad/s. Find the rate at which the area of the triangle is increasing when the angle between the two given sides is $\pi/3$.