

## Answer on Question #41381– Math - Integral Calculus

### Question:

Find  $dw/dt$  at  $t=(\pi)/2$

where  $w=x^2+y^2+2x+3y$  ,  $x=\cos t$  ,  $y=\sin t$

### Solution:

$$\frac{dw}{dt} = \frac{d}{dt}(x^2 + y^2 + 2x + 3y) = 2x * x' + 2y * y' + 2x' + 3y'.$$

Since,  $x' = -\sin t$ , and  $y' = \cos t$ , we get

$$\frac{dw}{dt} = 2 \cos t * (-\sin t) + 2 \sin t * \cos t + 2(-\sin t) + 3 \cos t =$$

$$= -2 \cos t * \sin t + 2 \sin t * \cos t - 2 \sin t + 3 \cos t = -2 \sin t + 3 \cos t.$$

$$\text{Thus, } \frac{dw}{dt} \left( \frac{\pi}{2} \right) = -2 \sin \frac{\pi}{2} + 3 \cos \frac{\pi}{2} = -2 + 0 = -2.$$

### Answer:

$$\frac{dw}{dt} \left( \frac{\pi}{2} \right) = -2.$$