Quiz 4 MATH 2501 Fall 2018

Compute

$$\frac{d}{dt}\sin(\cos(x))$$

where $x = t^2 + 5t$.

Soln: $\frac{d}{dt}\sin(\cos(x)) = \frac{dx}{dt}\frac{d}{dx}\sin(\cos(x))$

$u = \cos x$, $\frac{du}{dx} = -\sin x$

$$= \frac{dx}{dt}\frac{du}{dx}\frac{d}{du}\sin(u)$$

$\frac{dx}{dt} = 2t+5$

$$= (2t+5)(-\sin x)\cos(u)$$

$x = t^2+5t$, $u = \cos(x)$

$$= (2t+5)(-\sin(t^2+5t))\cos(\cos(t^2+5t))$$