3.6 Repeated Chain Rule

Find the derivatives of the following functions:

$g(x) = \tan(5 - \sin 3t)$

$f(x) = \sqrt{1 + \cos^2(3x)}$

$h(x) = (\sin(x^3 - 2x) + \cos(4x))^4$

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Chain Rule for Parametrics:

$$\text{slope} = \frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$

Find the tangent to the circle defined by:

$x(t) = \cos t$
$y(t) = \sin t$

at $t = \frac{\pi}{4}$

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Find the tangent to the hyperbola branch defined by:

$x(t) = \sec t$
$y(t) = \tan t$

$-\frac{\pi}{2} < t < \frac{\pi}{2}$

at $t = \frac{\pi}{4}$

Sep 29-9:40 AM