Liebniz Chain Rule Handout

Instructions.

In all exercises, use the liebniz form of the chain rule to compute the derivative.

1. $y = 4x^2 + 5x + 1$; $x = \sin(t)$; compute $\frac{dy}{dt}$
2. $y = \sin(t)$; $t = x^2 + x + 2$; compute $\frac{dy}{dx}$
3. $y = 4x^2 - 2x$; $x = \frac{3t^2}{t+1}$; compute $\frac{dy}{dt}$
4. $x = 4t^2 - 2t + 2$; $t = 7y + 4$; compute $\frac{dx}{dy}$
5. $y = \sin(t)$; $t = \sin(x)$; compute $\frac{dy}{dx}$

Answers

1. $\frac{dy}{dt} = (8\sin(t) + 5)\cos(t)$
2. $\frac{dy}{dx} = \cos(x^2 + x + 2)(2x + 1)$
3. $\frac{dy}{dt} = \left(\frac{24t^2 - 2t - 2}{t+1}\right)\left(\frac{3t^2+6t}{(t+1)^2}\right)$
4. $\frac{dx}{dy} = 392y + 210 =$
5. $\frac{dy}{dx} = \cos(\sin(x))\cos(x)$