61. $\frac{3}{x^3-4} = \frac{(x^3-4)(0)-3(3x^2)}{(x^3-4)^2}$

$\frac{-9}{25}$

19. $\left(\frac{1}{t-3}\right)^2$

$u = \frac{1}{t-3}$ $\quad y = u^2$

$\frac{du}{dt} = \frac{-1(1)}{(t-3)^2}$ $\quad \frac{dy}{du} = 2u$

$\frac{-1}{(t-3)^2} \cdot 2\left(\frac{1}{t-3}\right) = \frac{-2}{(t-3)^3}$

2.4 C Trig

A. Trig use the Chain Rule as well

1. $y = \cos(4x)$

$u = 4x$ $\quad y = \cos u$

$\frac{du}{dx} = 4$ $\quad \frac{dy}{du} = -\sin u$

$-4\sin(4x)$

2. $4x\cos(5x)$

$4\cos(5x) + 4x(-5\sin(5x))$

$4\cos(5x) - 20x\sin(5x)$

$u = 5x \quad y = \cos u$

$\frac{du}{dx} = 5 \quad \frac{dy}{du} = -\sin u$

$-5\sin(5x)$

3. $y = \sin^3 4t = (\sin 4t)^3$

$u = \sin 4t \quad y = u^3$

$\frac{du}{dt} = 4\cos(4t) \quad \frac{dy}{du} = 3u^2$

$4\cos(4t) \cdot 3(\sin 4t)^2$

$12\cos(4t)(\sin(4t))^2$

$u = 4t \quad y = \sin u$

$\frac{du}{dt} = 4 \quad \frac{dy}{du} = \cos u$