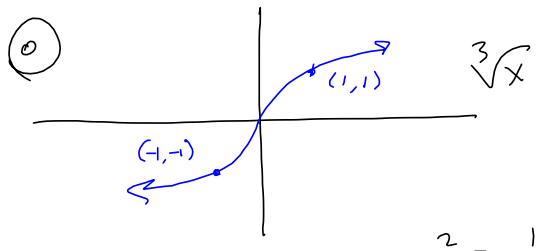
$\sqrt[3]{2x-4} = (2x-4)^{\frac{2}{3}}$ or $(2x-4)^{\frac{3}{2}}$ ↳ No!

$(2x-4)^{\frac{1}{3}}$

See College Algebra Videos

Writing Project #2

Basic functions. $f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$



$\frac{2}{3} = \frac{1}{3} \cdot 2 = 2 \cdot \frac{1}{3}$

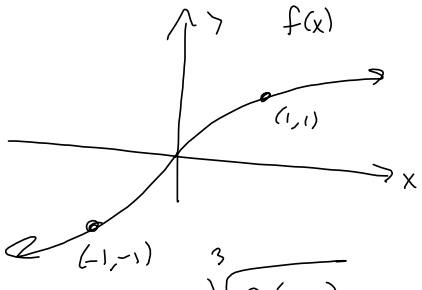
$x^{\frac{2}{3}} = x^{\frac{1}{3} \cdot 2} = \left(x^{\frac{1}{3}}\right)^2 = \left(x^2\right)^{\frac{1}{3}}$

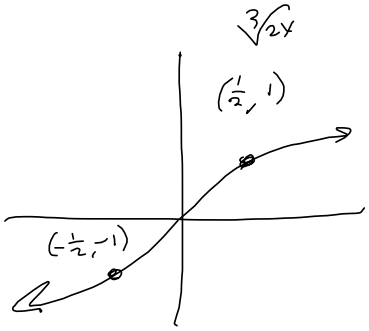
$\sqrt[3]{2x-4}$

① $\sqrt[3]{2x} = \sqrt[3]{2}\sqrt[3]{x}$

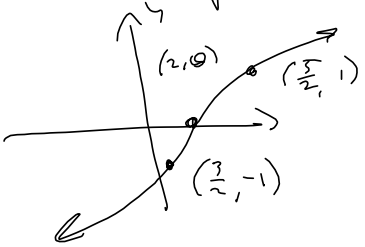
$f(2x)$

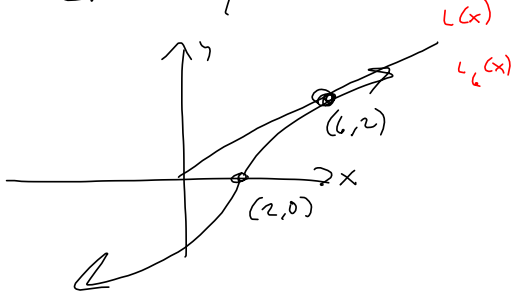
$(x,y) \longmapsto ($





$\sqrt[3]{2(x-2)}$





#6 $\sqrt[3]{28}$

$f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$

$x_1 = 27$

want $f(28)$

$f(27) = 3$

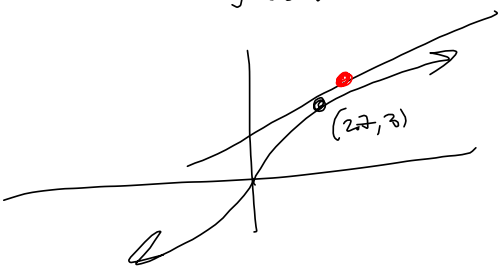
$f'(x) = \frac{1}{3}x^{-2/3}$

$f'(27) = \frac{1}{3}(27)^{-2/3} = \frac{1}{3}\left((27)^{\frac{1}{3}}\right)^{-2} = \frac{1}{3}(3)^{-2} = \frac{1}{3}\left(\frac{1}{3^2}\right)$

$= \frac{1}{27} = m$

$L_{27}(x) = \frac{1}{27}(x-27)+3$

$f'(27)(x-27)+f(27)$



So $L_{27}(28) = \frac{1}{27}(28-27)+3$

$= \frac{1}{27}+3 = \frac{82}{27}$

$= 3.037$

$\sqrt[3]{28} \approx 3.036588972$

≈ 3.037

$5(x+y)^3 \neq (5x+5y)^3$

$\left(\sqrt[3]{5}\right)^3(x+y)^3 = \left(\sqrt[3]{5}(x+y)\right)^3$

$A^3B^3 = (AB)^3$

$\sin(32^\circ) = \sin(30^\circ + 2^\circ)$

$x_1 = 30^\circ$, $\Delta x = 2$

$\sin(30^\circ + 2^\circ)$

$\approx \cos(30^\circ)(2^\circ)\left(\frac{\pi}{180^\circ}\right) + \sin(30^\circ)$

$= \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\pi}{90}\right) + \frac{1}{2}$

Tan Line:

$y = f'(x_1)(x - x_1) + f(x_1)$

$= f(x_1) + f'(x_1)(x - x_1)$

New $f(x)$

$\sqrt[3]{28} = f(27+1) = f(x_1 + \Delta x)$, where

$x_1 = 27$ and $\Delta x = 1$

$f(x_1 + \Delta x) \approx f(x_1) + f'(x_1)\Delta x$ → dy

$f(x) = y \approx f(x_1) + f'(x_1)(x - x_1)$

$f(x_1 + \Delta x) - f(x_1) = \Delta y \approx dy = f'(x_1)\Delta x = f'(x_1)\,dx$