quiz 12
math1117.07
u new haven
fri, 25 oct

name: solution

1 (4 points each). Compute the following derivatives:

(a) $f(x) = \dfrac{x^3 - 4x^2 + x}{x - 2}$ (b) $y = (2\sqrt{x} - 1)(4x + 1)^{-1}$ (c) $y = \dfrac{4}{p^3}$

a) $\dfrac{d}{dx}(f(x)) = \dfrac{\frac{d}{dx}(x^3-4x^2+x)(x-2) - (x^3-4x^2+x)\cdot\frac{d}{dx}(x-2)}{(x-2)^2}$

$= \dfrac{(3x^2-8x+1)(x-2) - (x^3-4x^2+x)(1)}{(x-2)^2}$

b) $\dfrac{dy}{dx} = \dfrac{d}{dx}\left(\dfrac{2x^{1/2}-1}{4x+1}\right) = \dfrac{\frac{d}{dx}(2x^{1/2}-1)(4x+1) - (2x^{1/2}-1)\frac{d}{dx}(4x+1)}{(4x+1)^2}$

$= \dfrac{(x^{-\frac{1}{2}})(4x+1) - (2x^{1/2}-1)(4)}{(4x+1)^2}$

c) $\dfrac{dy}{dp} = \dfrac{d}{dp}\left(\dfrac{4}{p^3}\right) = \dfrac{\frac{d}{dp}(4)\cdot p^3 - 4\cdot\frac{d}{dp}(p^3)}{(p^3)^2} = \dfrac{0\cdot p^3 - 4(3p^2)}{p^6}$

$= -\dfrac{12p^2}{p^6} = -\dfrac{12}{p^4}$