Review before Implicit test

1. Find dy/dx for the following curve

$x^2y + y^2x = -2$

$y' = \dfrac{-2xy - y^2}{x^2 + 2yx}$

2 Find the $\dfrac{d^2y}{dx^2}$

1-xy=x-y

$y' = \dfrac{1+y}{1-x}$

$y'' = \dfrac{2y+2}{(x-1)^2}$

3 Joey is perched precariously at the top of a 10 foot ladder leaning against the back wall of an apartment building when it starts to slide down the wall at a rate of 4ft/min. Joey's accomplice, Lou is standing on the ground 6 ft away from the wall. How fast is the base of the ladder moving when it hits lou?

$x=6 \quad x'=?$

$y=8 \quad y'=-4$ ft/min

$c=10 \quad c'=0$

$x' = \dfrac{32}{6}$ ft/min

4. Find dy/dx of the curve $y=\cos^3(x^2)$

$y' = -6x(\cos x^2)^2 \sin x^2$

5. A cone-shaped icicle is dripping from the roof.
The radius of the icicle is decreasing at a rate of 0.2 cm/hour, while the length is increasing at a rate of 0.8 cm/hour.
If the icicle is currently 4 cm in radius and 20 cm long, is the volume of the icicle increasing or decreasing, and at what rate?

$r' = -.2 \quad r = 4$

$h' = .8 \quad h = 20$

$V' = -\dfrac{19.2\pi}{3}$

$V' = -20.106$ cm^3/hr

decreasing at a rate

Now let's find the equation of the line tangent to the

6 curve $x^2y + 3x = y^2 + 1$ at the point $(1, -1)$

$y = -\dfrac{1}{3}x - \dfrac{2}{3}$