Find $\frac{dy}{dx}$ (Implicit Diff)

1) $x^2+xy=0$

$x^2=-xy$

$-x=y$

$\frac{dy}{dx}=-1$

2) $y^2+xy=0$ Assume $y=f(x)$

$y=\frac{-x\pm\sqrt{x^2-4(1)0}}{2}$

$y=\frac{-x\pm\sqrt{x^2}}{2}$

$y=\frac{-x\pm|x|}{2}$

$\frac{-x+x}{2}$ $x\geq 0$

$\frac{-x+(-x)}{2}$ $x<0$

$2y\cdot\frac{dy}{dx}+1\cdot y+x\frac{dy}{dx}=0$

$2y\frac{dy}{dx}+x\frac{dy}{dx}=-y$

$\frac{dy}{dx}(2y+x)=-y$

$\frac{dy}{dx}=\frac{-y}{2y+x}$

$|x|=\begin{cases} x, & x\geq 0 \\ -x, & x<0 \end{cases}$

5. $x^3 + y^3 = 1$

$$3x^2 + 3y^2 \cdot \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-3x^2}{3y^2} = -\frac{x^2}{y^2}$$

9. $x^4(x + y) = y^2(3x - y)$

$4x^3(x+y) + x^4\left(1 + \frac{dy}{dx}\right) = 2y\frac{dy}{dx}(3x - y)$

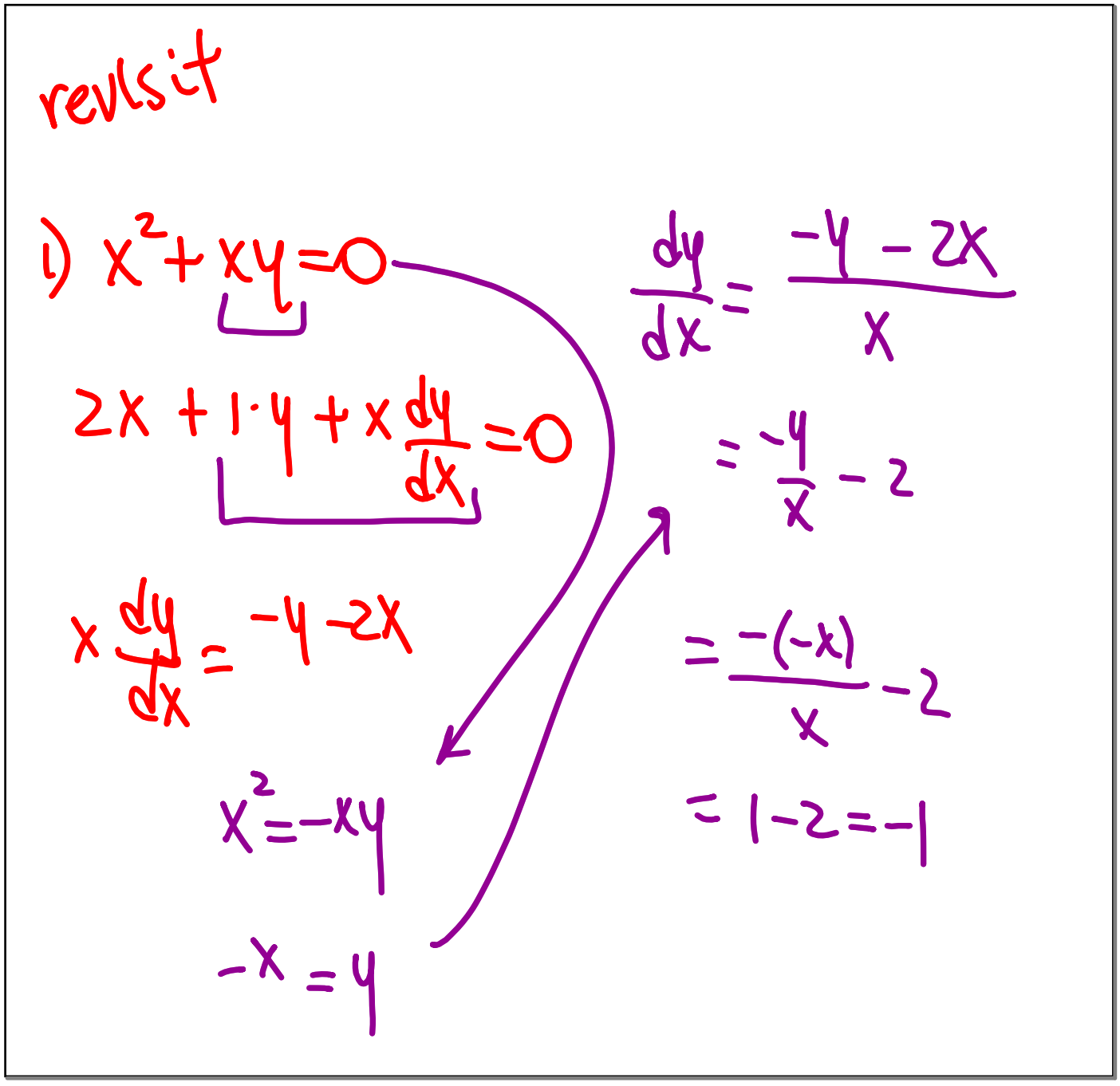
$+ y^2\left(3 - \frac{dy}{dx}\right)$

$y^2 + xy = 0$ assume $y = f(x)$

$$\left(f(x)\right)^2 + x(f(x)) = 0$$

$$2f(x)\cdot f'(x) + 1\cdot f(x) + x f'(x) = 0$$

$$2y\frac{dy}{dx} + y + x\frac{dy}{dx} = 0$$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1) $x^2 + xy = 0$
$2x + 1 \cdot y + x\frac{dy}{dx} = 0$
$x\frac{dy}{dx} = -y - 2x$
$x^2 = -xy$
$-x = y$
$\frac{dy}{dx} = \frac{-y-2x}{x}$
$= \frac{-y}{x} - 2$
$= \frac{-(-x)}{x} - 2$
$= 1 - 2 = -1$