uation of the tangent line to the curve at the

Name Day 1 Pd.

12. $x^2+2xy-y^2+x=2,\ (1,2)$

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

$2x\frac{dy}{dx}-2y\frac{dy}{dx}=-1-2x-2y$

$\frac{dy}{dx}[2x-2y]=-1-2x-2y$

$\frac{dy}{dx}=\frac{-1-2x-2y}{2x-2y}$

$\left.\frac{dy}{dx}\right|_{(1,2)}=\frac{-1-2(1)-2(2)}{2(1)-2(2)}=\frac{-1-2-4}{2-4}=\frac{-7}{-2}=\frac{7}{2}$

$y-2=\frac{7}{2}(x-1)$

14. $x^4+y^4=a^4 \quad a^4=\text{constant}$

$4x^3+4y^3\frac{dy}{dx}=0$

$4y^3\frac{dy}{dx}=-4x^3$

$\frac{dy}{dx}=\frac{-4x^3}{4y^3}$

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

$\frac{d}{dx}\left[\frac{dy}{dx}=\frac{-x^3}{y^3}\right]$

$\frac{d^2y}{dx^2}=\frac{y^3(-3x^2)-(-x^3)3y^2\frac{dy}{dx}}{y^6}$

$\frac{d^2y}{dx^2}=\frac{-3x^2y^3+3x^3y^2\left(\frac{-x^3}{y^3}\right)}{y^6}$ $\quad (y^3)$

$\frac{d^2y}{dx^2}=\frac{-3x^2y^6-3x^6y^2}{y^3}\cdot\frac{1}{y^6}$

$\frac{d^2y}{dx^2}=\frac{-3x^2y^6-3x^6y^2}{y^9}$

$\frac{d^2y}{dx^2}=\frac{-3x^2y^2[y^4+x^4]}{y^{9-2}}$

$\frac{d^2y}{dx^2}=\frac{-3x^2[a^4]}{y^7}$

$\frac{d^2y}{dx^2}=\frac{-3x^2a^4}{y^7}$

2. $x^2+xy-y^2=4$ $\quad 2x+xy'+y(1)-2yy'=0$

$xy'-2yy'=-2x-y$

$y'[x-2y]=-2x-y$

$y'=\frac{-2x-y}{x-2y}$

4. $xe^y=x-y$

$xe^yy'+e^y(1)=1-(1)y'$

$xe^yy'+y'=1-e^y$

$y'(xe^y+1)=1-e^y$

$y'=\frac{1-e^y}{xe^y+1}$

6. $\cos(xy)=1+\sin y$

$-\sin(xy)[xy'+y(1)]=\cos y\,y'$

$-xy'\sin(xy)-y\sin(xy)=\cos y\cdot y'$

$y'[-x\sin(xy)-\cos y]=y\sin(xy)$

$y'=\frac{y\sin(xy)}{-x\sin(xy)-\cos y}$

8. $e^y\sin x=x+xy$

$e^y\cos x+\sin x\,e^yy'=1+xy'+y(1)$

$\sin x\,e^yy'-xy'=1+y-e^y\cos x$

$y'=\frac{1+y-e^y\cos x}{\sin x\,e^y-x}$

10. $\sqrt{x+y}=1+x^2y^2 \quad (x+y)^{1/2}=1+x^2y^2$

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

$\frac{(\sqrt{x+y})(1+y')}{2\sqrt{x+y}}=(2x^2yy'+2xy^2)(2\sqrt{x+y})$

$1+y'=4x^2yy'\sqrt{x+y}+4xy^2\sqrt{x+y}$

$y'-4x^2y\sqrt{x+y}\,y'=4xy^2\sqrt{x+y}-1$

$y'=\frac{4xy^2\sqrt{x+y}-1}{1-4x^2y\sqrt{x+y}}$