Implicit Differentiation- HW Problems

Find $\dfrac{dy}{dx}$.

1. $4x^2 + 16y^2 = 1$

2. $x^2 + xy + y^2 = 3$

3. $x^2y - xy^2 = 2$

4. $\cos(x - y) = y^2 \sin(x)$

5. $\tan\left(\dfrac{y}{x}\right) = x^2 + y^2$

6. $y = (x - \cos(x))^{\frac{1}{3}}$

7. $y = (x - \cos(y))^{\frac{1}{3}}$

Find an equation of the tangent line at the given point.

8. $x\sin(y) = 1 \quad at \ (2, \dfrac{\pi}{6})$

9. $y\sin(8x) = x\cos(2y) \quad at \ (\dfrac{\pi}{2}, \dfrac{\pi}{4})$

10. $x^2 + xy - y^2 + y = 1 \quad at \ (1,2)$