Topic 13: Implicit differentiation

Compute the slope of the tangent line at the given point.

1. $x^2+4y^2=8$ at $(2,1)$

2. $y-3x^2y=\cos x$ at $(0,1)$

Find the derivative $y'(x)$ implicity.

3. $x^2y^2+3y=4x$

4. $\sqrt{xy}-4y^2=12$

5. $\dfrac{x+y}{y}=4x+y^2$

6. $e^{x^2y}-e^y=x$

7. Find an equation of the tangent line at (2,1) for $x^2-4y^2=0$.

Answers

1) $-\dfrac{1}{2}$

2) 0

3) $y'(x)=\dfrac{4-2xy^2}{3+2x^2y}$

4) $y'(x)=\dfrac{y}{16y\sqrt{xy}-x}$

5) $y'(x)=\dfrac{y-4y^2}{x+2y^3}$

6) $y'(x)=\dfrac{1-2xye^{x^2y}}{x^2e^{x^2y}-e^y}$

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