Ws 1 - Implicit Differentiation

Find dy/dx by implicit differentiation.

1. $x^2+y^2=36$
2. $\sqrt{x}+\sqrt{y}=9$
3. $x^3-xy+y^2=4$
4. $x^3y^3-y=x$
5. $x^3-3x^2y+2xy^2=12$
6. $\sin x+2\cos 2y=1$
7. $\sin x = x(1+\tan y)$
8. $y=\sin(xy)$
9. $x^3+y^3=8$
10. $x^2y+y^2x=-2$

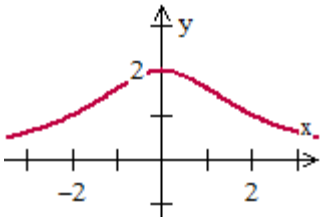
Find the slope at the given point.

11. $xy=4$; $(-4,-1)$
12. $x^2-y^3=0$; $(1,1)$
13. $y^2=\dfrac{x^2-4}{x^2+4}$; $(2,0)$
14. Find the slope of the tangent line at the given point.

    Witch of Agnesi

    $(x^2+4)y=8$

    Point: $(2,1)$



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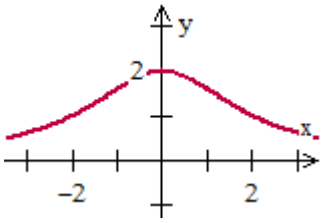

Answers

1. $\frac{dy}{dx}=\frac{-x}{y}$
2. $\frac{dy}{dx}=-\sqrt{\frac{y}{x}}$
3. $\frac{dy}{dx}=\frac{y-3x^2}{2y-x}$
4. $\frac{dy}{dx}=\frac{1-3x^2y^3}{3x^3y^2-1}$
5. $\frac{dy}{dx}=\frac{6xy-3x^2-2y^2}{4xy-3x^2}$
6. $\frac{dy}{dx}=\frac{\cos x}{4\sin 2y}$
7. $\frac{dy}{dx}=\frac{\cos x-\tan y-1}{x\sec^2 y}$
8. $\frac{dy}{dx}=\frac{y\cos(xy)}{1-x\cos(\text{xy})}$
9. $\frac{dy}{dx}=-\frac{x^2}{y^2}$
10. $\frac{dy}{dx}=\frac{-y(y+2x)}{x(x+2y)}$
11. $-\frac{1}{4}$
12. $\frac{2}{3}$
13. Undefined!
14. $y-1=-\frac{1}{2}(x-2)$

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