

Implicit differentiation worksheet

Directions: Find $\frac{dy}{dx}$ of the following functions. (In other words, solve for $\frac{dy}{dx}$)

1. $y^2 = x$

2. $3x^2 + y^2 = 14$

3. $(2x - 3)^2 + (4y - 5)^2 = 10$

4. $x^2 \sin(x) + y^2 \cos(y) = 1$

5. $x^2 y^2 = 1$

6. $y^2 \tan(x) = x$

7. $4x^2 + 3xy^2 - 6x^2y = y^3$

8. $\sqrt{y} + xy^2 = 5$

9. $x\sqrt{y+2} = 4$

10. $x = \sqrt{\tan(y)}$

11. $x = \sqrt{\tan(y^2)}$

Solutions:

1. $\frac{1}{2y}$

2. $-\frac{3x}{y}$

3. $\frac{3-2x}{8y-10}$

4. $-\frac{2x\sin(x)+x^2\cos(x)}{2y\cos(y)-y^2\sin(y)}$

5. $-\frac{y}{x}$

6. $(1 - y^2 \sec^2 x)/2y \tan(x)$

7. $\frac{8x+3y^2-12xy}{3y^2+6x^2-6xy}$

8. $-\frac{2y^{\frac{5}{2}}}{1+4xy^{\frac{3}{2}}}$

9. $\frac{-2(y+2)}{x}$

10. $(2\sqrt{\tan(y)})/(\sec^2 y)$

11. $(\sqrt{\tan(y)})/(y \sec^2 y)$