

Derivatives

Implicit Derivatives

1. *implicit derivative* $\frac{dy}{dx}$, $xy = x + y$

2. *implicit derivative* $\frac{dy}{dx}$, $x^2 + y^2 = 4$

3. *implicit derivative* $\frac{dy}{dx}$, $x^3 + y^3 = 6xy$

4. *implicit derivative* $\frac{dy}{dx}$, $x^2 + y^2 = 25$

5. *implicit derivative* $\frac{dy}{dx}$, $(x + 2)^2 + (y - 3)^2 = 37$

6. *implicit derivative* $\frac{dy}{dx}$, $\sqrt{x} + \sqrt{y} = 3$

7. *implicit derivative* $\frac{dy}{dx}$, $x^{\frac{2}{3}} + y^{\frac{2}{3}} = 4$

8. *implicit derivative* $\frac{dy}{dx}$, $y^2(y^2 - 4) = x^2(x^2 - 5)$

9. *implicit derivative* $\frac{dy}{dx}$, $y = \sin(xy)$

10. *implicit derivative* $\frac{dy}{dx}$, $x^2(x - y)^2 = x^2 - y^2$

Answers

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

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

$$3. \frac{dy}{dx} = \frac{2y-x^2}{y^2-2x}$$

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

$$5. \frac{dy}{dx} = -\frac{x+2}{y-3}$$

$$6. \frac{dy}{dx} = -\sqrt{\frac{y}{x}}$$

$$7. \frac{dy}{dx} = -\left(\frac{y}{x}\right)^{\frac{1}{3}}$$

$$8. \frac{dy}{dx} = \frac{x(2x^2-5)}{2y(y^2-2)}$$

$$9. \frac{dy}{dx} = \frac{y\cos(xy)}{1-x\cos(xy)}$$

$$10. \frac{dy}{dx} = \frac{x(-2x^2+3xy+1-y^2)}{-x^3+y+x^2y}$$