



find  $\frac{dy}{dx}$

$$y^2 + 3x^3 = 9 - 4y^5$$

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① differentials

$$2y dy + 9x^2 dx = -20y^4 dy$$

② separate dy + dx

$$\frac{-2y dy}{9x^2 dx} = \frac{-20y^4 dy}{-20y^4 dy}$$

$$9x^2 dx = -20y^4 dy - 20y^4 dy$$

③ factor out dy + dx

$$\frac{9x^2(dx)}{dx} = \frac{dy(-20y^4 - 2y)}{dx}$$

④ solve for  $\frac{dy}{dx}$

$$\frac{9x^2}{-20y^4 - 2y} = \frac{\frac{dy}{dx}(-20y^4 - 2y)}{-20y^4 - 2y}$$

$$\boxed{\frac{dy}{dx} = \frac{9x^2}{-20y^4 - 2y}}$$

$$\frac{-9x^2}{20y^4 + 2y}$$

$$y^2 + 3x^3 = 9 - 4y^5$$

find  $\frac{dy}{dx}$

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① differentials

$$2y dy + 9x^2 dx = -20y^4 dy$$

② separate

$$\frac{-2y dy}{9x^2 dx} = \frac{-20y^4 dy}{-20y^4 dy}$$

$$9x^2 dx = -20y^4 dy - 20y^4 dy$$

③ factor

$$\frac{(9x^2)dx}{dx} = \frac{dy(-20y^4 - 2y)}{dx}$$

④ solve for  $\frac{dy}{dx}$

$$\frac{9x^2}{-2y - 20y^4} = \frac{\left(\frac{dy}{dx}\right)(-2y - 20y^4)}{-2y - 20y^4}$$

$$\boxed{\frac{dy}{dx} = \frac{9x^2}{-2y - 20y^4}}$$