

Homework 11

$$(2) \quad 4x^3 y^3 = -2y$$

$$4x^3 \cdot 3y^2 \cdot \frac{dy}{dx} + y^3 \cdot 12x^2 \cdot \frac{dx}{dx} = -2 \cdot \frac{dy}{dx}$$

$$12x^3 y^2 \frac{dy}{dx} + 12x^2 y^3 = -2 \frac{dy}{dx}$$

$$12x^3 y^2 \frac{dy}{dx} + 2 \frac{dy}{dx} = -12x^2 y^3$$

$$\frac{dy}{dx} (12x^3 y^2 + 2) = -12x^2 y^3$$

$$\frac{dy}{dx} = \frac{-12x^2 y^3}{12x^3 y^2 + 2}$$

$$(3) \quad 7 \sin(xy^2) = 5$$

$$7 \cos(xy^2) (xy^2)' = 0 \quad \parallel$$

$$7 \cos(xy^2) \left(x \cdot 2y \cdot \frac{dy}{dx} + y^2 \cdot \frac{dx}{dx} \right) = 0$$

$$7 \cos(xy^2) \left(2xy \frac{dy}{dx} + y^2 \right) = 0$$

$$14xy \cos(xy^2) \frac{dy}{dx} + 7y^2 \cos(xy^2) = 0$$

$$14xy \cos(xy^2) \frac{dy}{dx} = -7y^2 \cos(xy^2)$$

$$\frac{dy}{dx} = \frac{-7y^2 \cancel{\cos(xy^2)}}{2 \cancel{14} xy \cancel{\cos(xy^2)}}$$

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