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1 Partial derivatives solving

$$1) f(x, y) = 2x^2y^3 + \frac{1}{x} + y^2x + 7$$

$$\frac{\partial f(x, y)}{\partial x} = 4y^3x - \frac{1}{x^2} + y^2$$

$$\frac{\partial f(1, 2)}{\partial x} = 4 * 8 * 1 - 1 + 4 = 35$$

$$\frac{\partial f(x, y)}{\partial y} = 6x^2y^2 + 2xy$$

$$\frac{\partial f(1, 2)}{\partial y} = 6 * 1 * 4 + 2 * 2 = 28$$

$$\text{Solution: } \text{grad}_f(1, 2) = (35, 28)$$

$$2) f(x, y) = x^2y - \sin(xy) + \cos(x^2) + 6y$$

$$\frac{\partial f(x, y)}{\partial x} = 2xy - y * \cos(xy) - 2x * \sin(x^2)$$

$$\frac{\partial f(x, y)}{\partial y} = x^2 - x * \sin(xy) + 6$$