

1. If  $\sin(xy) = x^2$ , then  $\frac{dy}{dx} =$

- A)  $2x \sec(xy)$
- B)  $\frac{\sec(xy)}{x^2}$
- C)  $2x \sec(xy) - y$
- D)  $\frac{2x \sec(xy)}{y}$
- E)  $\frac{2x \sec(xy) - y}{x}$

$$\cos(xy) \cdot (x \frac{dy}{dx} + y) = 2x$$

$$x \frac{dy}{dx} + y = \frac{2x}{\cos(xy)} = 2x \sec(xy)$$

$$x \frac{dy}{dx} = 2x \sec(xy) - y$$

$$\frac{dy}{dx} = \frac{2x \sec(xy) - y}{x}$$

2. If  $x + y = xy$ , then  $\frac{dy}{dx} =$

- A)  $\frac{1}{x-1}$
- B)  $\frac{y-1}{x-1}$
- C)  $\frac{1-y}{x-1}$
- D)  $x + y - 1$
- E)  $\frac{2-xy}{y}$

$$1 + \frac{dy}{dx} = x \frac{dy}{dx} + y$$

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

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

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

3. If  $y^2 - 2xy = 21$ , then  $\frac{dy}{dx}$  at the point  $(2, -3)$  is

- A)  $-\frac{6}{5}$
- B)  $-\frac{3}{5}$
- C)  $-\frac{2}{5}$
- D)  $\frac{3}{8}$
- E)  $\frac{3}{5}$

$$2y \frac{dy}{dx} - 2(x \frac{dy}{dx} + y) = 0$$

$$2y \frac{dy}{dx} - 2x \frac{dy}{dx} - 2y = 0$$

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

$$\left. \frac{dy}{dx} \right|_{(2,-3)} = \frac{2y}{2y-2x} \Big|_{(2,-3)} = \frac{y}{y-x} \Big|_{(2,-3)} = \frac{-3}{-3-2} = \frac{3}{5}$$