

Opener – Multiple Choice 4.2

Name _____

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

A) $\frac{1}{x-1}$

B) $\frac{y-1}{x-1}$

C) $\frac{1-y}{x-1}$

D) $x + y - 1$

E) $\frac{2-xy}{y}$

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

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

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

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

2. 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) $\frac{3}{5}$

$$2yy' - (y \cdot 2 + 2xy') = 0$$

$$2yy' - 2y - 2xy' = 0$$

$$\frac{2yy'}{2} - \frac{2xy'}{2} = \frac{2y}{2}$$

$$\begin{aligned} y'(y-x) &= y \\ y' &= \frac{y}{y-x} = \frac{-3}{-3-2} \\ &= \frac{-3}{-5} \end{aligned}$$