

Solving Systems of Equations by Substitution

What is the solution of the system?

$$\textcircled{1} \begin{cases} 2x + y = -7 \\ y = 4x + 5 \end{cases}$$

$$2x + (4x + 5) = -7$$

$$2x + 4x + 5 = -7$$

$$6x + 5 = -7$$

$$y = 4x + 5$$

$$y = 4(-2) + 5$$

$$y = -8 + 5$$

$$\boxed{y = -3}$$

$$\boxed{(-2, -3)}$$

$$\begin{array}{r} -5 \quad -5 \\ \hline \end{array}$$

$$6x = -12$$

$$\frac{6}{6} \quad \frac{-12}{6}$$

$$\boxed{x = -2}$$

$$\textcircled{2} \begin{cases} y = 14x \\ y = \frac{1}{2}(28x + 15) \end{cases}$$

$$14x = \frac{1}{2}(28x + 15)$$

$$14x = \frac{1}{2}(28x) + \frac{1}{2}(15)$$

$$14x = 14x + \frac{15}{2}$$

$$\begin{array}{r} -14x \quad -14x \\ \hline \end{array}$$

$$0 \neq \frac{15}{2}$$

$$\boxed{\text{No Solution}}$$

$$\textcircled{3} \begin{cases} 4x + 2y = 20 \\ y = -2x + 10 \end{cases}$$

$$4x + 2(-2x + 10) = 20$$

$$4x - 4x + 20 = 20$$

$$20 = 20$$

Infinitely Many Solutions