**Topic**: Solving systems with substitution

**Question**: Use substitution to find the unique solution to the system of equations.

$$y = x + 7$$

$$x + 2y = -16$$

**Answer choices**:

A $(10,3)$

B $(-10,3)$

C $(10,-3)$

D $(-10,-3)$

**Solution**: D

Since the first equation is already solved for $y$, we'll make a substitution for $y$ in the second equation, so that we can get the second equation in terms of only $x$ and then solve for $x$.

$$x + 2y = -16$$

$$x + 2(x + 7) = -16$$

$$x + 2x + 14 = -16$$

$$3x + 14 = -16$$

$$3x = -30$$

$$x = -10$$

Now we'll take the value we found for $x$ and plug it into the first equation to find the value of $y$.

$$y = x + 7$$

$$y = -10 + 7$$

$$y = -3$$



**Topic**: Solving systems with substitution

**Question**: Use substitution to find the unique solution to the system of equations.

$$y = x + 3$$

$$2x + y = 10$$

**Answer choices**:

A $\left(-\frac{16}{3}, -\frac{7}{3}\right)$

B $\left(-\frac{7}{3}, -\frac{16}{3}\right)$

C $\left(\frac{16}{3}, \frac{7}{3}\right)$

D $\left(\frac{7}{3}, \frac{16}{3}\right)$

**Solution**: D

Since the first equation is already solved for $y$, we'll make a substitution for $y$ in the second equation, so that we can get the second equation in terms of only $x$ and then solve for $x$.

$$2x + y = 10$$

$$2x + (x + 3) = 10$$

$$2x + x + 3 = 10$$

$$3x + 3 = 10$$

$$3x = 7$$

$$x = \frac{7}{3}$$

Now we'll take the value we found for $x$ and plug it into the first equation to find the value of $y$.

$$y = x + 3$$

$$y = \frac{7}{3} + 3$$

$$y = \frac{7}{3} + \frac{9}{3}$$

$$y = \frac{16}{3}$$



**Topic**: Solving systems with substitution

**Question**: Use substitution to find the unique solution to the system of equations.

$$3x - y = -5$$

$$y = -2x - 5$$

**Answer choices**:

A $(2,1)$

B $(-2,1)$

C $(-2,-1)$

D $(2,-1)$

**Solution**: C

Since the second equation is already solved for $y$, we'll make a substitution for $y$ in the first equation, so that we can get the first equation in terms of only $x$ and then solve for $x$.

$$3x - y = -5$$

$$3x - (-2x - 5) = -5$$

$$3x + 2x + 5 = -5$$

$$5x + 5 = -5$$

$$5x = -10$$

$$x = -2$$

Now we'll take the value we found for $x$ and plug it into the second equation to find the value of $y$.

$$y = -2x - 5$$

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

$$y = 4 - 5$$

$$y = -1$$