Systems of Equations - Unique Solution

$$x + y + 2z = 0 \quad \text{①}$$
$$2x - y + z = -6 \quad \text{②}$$
$$3x + 4y - z = -6 \quad \text{③}$$

②+③ $\quad 5x + 3y = -12 \quad \text{Ⓐ}$

2×③ $\quad 6x + 8y - 2z = -12$

① $\quad x + y + 2z = 0$

$\quad 7x + 9y = -12 \quad \text{Ⓑ}$

3×Ⓐ $\quad 15x + 9y = -36 \quad \text{Ⓒ}$

Ⓒ−Ⓑ $\quad 8x = -24$

$\quad x = -3$

sub in Ⓑ $\quad -21 + 9y = -12$

$\quad 9y = 9$

$\quad y = 1$

sub in ① $\quad -3 + 1 + 2z = 0$

$\quad -2 + 2z = 0$

$\quad 2z = 2$

$\quad z = 1$

Unique solution at $(-3, 1, 1)$

Equation 1:	$x + y + 2z = 0$
Equation 2:	$2x - y + z = -6$
Equation 3:	$3x + 4y - z = -6$

(3,1,1)