Name: Key

6.2 Substitution

Solve the following systems using the substitution method.

1) $0 = x - 4 - y$
$3x + y = -8$

$-3x \quad -3x$

$y = -3x - 8$

$0 = x - 4 - (-3x - 8)$

$0 = x - 4 + 3x + 8$

$0 = 4x + 4$
$-4 \quad -4$

$-4 = 4x$

$x = -1$

$0 = (-1) - 4 - y$

$0 = -5 - y$
$+y \quad +y$

$y = -5$

$(-1, -5)$

2) $-m + 5n = -18$ → $m = 5n + 18$
$-13 = 2m - 3n$

$-13 = 2(5n + 18) - 3n$

$-13 = 10n + 36 - 3n$

$-36 \quad -36$

$-49 = 7n$

$n = -7$

$-13 = 2m - 3(-7)$

$-13 = 2m + 21$
$-21 \quad -21$

$-34 = 2m$

$m = -17$

$(-17, -7)$

3) $\left(\frac{1}{3}x + \frac{5}{6}y = 1\right) 6$
$\left(-\frac{1}{2}x - y = 1\right) 2$

$2x + 5y = 6$

$-x - 2y = 2$

$x = -2y - 2$

$2(-2y - 2) + 5y = 6$

$y = 10$

$2x + 5(10) = 6$

$2x + 50 = 6$

$x = -22$

$(-22, 10)$

4) $\left[\frac{1}{3}x + \frac{2}{3}y = 12\right] 3$

$x + 9y = -6$

$x = -9y - 6$

$x + 2y = 36$

$(-9y - 6) + 2y = 36$

$y = -6$

$x + 2(-6) = 36$

$x - 12 = 36$

$x = 48$

$(48, -6)$