Systems of Equations

Linear

Substitution

1) $y = 2x - 1$

$y + x = 11$

$(2x-1) + x = 11$

$3x - 1 = 11$

$3x = 12$

$x = 4$

$y = 2(4) - 1$

$y = 7$

$(4, 7)$

Elimination

$(x + 2y = -2)\ -2$

$2x - 3y = 6$

$-2x - 4y = 4$

$2x - 3y = 6$

$-7y = 10$

$y = \frac{-10}{7}$

$x + 2\left(\frac{-10}{7}\right) = -2$

$x - \frac{20}{7} = -2$

$x = \frac{6}{7}$

$\left(\frac{6}{7}, \frac{-10}{7}\right)$

Non-Linear

1) $y = 2x+1$

$2x + y^2 = 1$

$2x + (2x+1)^2 = 1$

$2x + (4x^2+4x+1) = 1$

$4x^2+6x+1 = 1$

$4x^2+6x = 0$

$2x(2x+3) = 0$

$2x = 0 \quad 2x+3 = 0$

$x = 0 \quad 2x = -3$

$x = \frac{-3}{2}$

$y = 2(0)+1 \quad y = 2(-\frac{3}{2})+1$

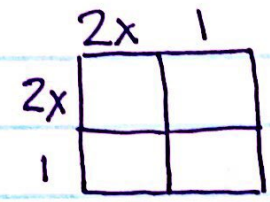
$y = 1 \quad y = -3+1$

$y = -2$

$(0,1) \quad (-\frac{3}{2}, -2)$

$(2x+1)(2x+1)$

FOIL



2) $2x^2+2xy=10$

$2(3x^2-xy=2)$

$2x^2+2xy=10$

$6x^2-2xy=4$

$8x^2=14$

$x^2=\frac{14}{8}$

$x^2=\frac{7}{4}$

$x=\pm\sqrt{\frac{7}{4}}$

$x=\pm 1.3$

$2(1.3)^2+2(1.3)y=10$

$3.38+2.6y=10$

$2.6y=6.62$

$y=2.5$

$(1.3, 2.5)$

$2(-1.3)^2+2(-1.3)y=10$

$3.38-2.6y=10$

$-2.6y=6.62$

$y=-2.5$

$(-1.3, -2.5)$