Solving Systems of Equations by Substitution Worksheet

1) $y = 6x - 11$
$-2x - 3y = -7$

$(2, 1)$

$-2x - 3(6x - 11) = -7$
$-2x - 18x + 33 = -7$
$-20x + 33 = -7$
$-33 \quad -33$
$-20x = -40$
$\frac{-20x}{-20} = \frac{-40}{-20}$
$x = 2$

$y = 6(2) - 11$
$y = 12 - 11$
$y = 1$

2) $2x - 3y = -1$
$y = x + 1$

$(-2, -1)$

$2x - 3(x + 1) = -1$
$2x - 3x - 3 = -1$
$-x - 3 = -1$
$+3 \quad +3$
$-x = 2$
$x = -2$

$y = -2 + 1$
$y = -1$

3) $y = -3x + 5$
$5x - 4y = -3$

$(1, 2)$

$5x - 4(-3x + 5) = -3$
$5x + 12x - 20 = -3$
$17x - 20 = -3$
$+20 \quad +20$
$\frac{17x}{17} = \frac{17}{17}$
$x = 1$

$y = -3(1) + 5$
$y = -3 + 5$
$y = 2$

4) $y = 5x - 7$
$-3x - 2y = -12$

$(2, 3)$

$-3x - 2(5x - 7) = -12$
$-3x - 10x + 14) = -12$
$-13x + 14 = -12$
$-14 \quad -14$
$\frac{-13x}{-13} = \frac{-26}{-13}$ $x = 2$

$y = 5(2) - 7$
$y = 10 - 7$
$y = 3$

5) $y = 4x + 6$
$-5x - y = 21$

$(-3, -6)$

$-5x - (4x + 6) = 21$
$-5x - 4x - 6 = 21$
$-9x - 6 = 21$ $x = -3$
$+6 \quad +6$
$\frac{-9x}{-9} = \frac{27}{-9}$

$y = 4(-3) + 6$
$y = -12 + 6$
$y = -6$

6) $x = 1 - 3y$
$3x + 3y = 15$

$(7, -2)$

$3(1 - 3y) + 3y = 15$
$3 - 9y + 3y = 15$
$3 - 6y = 15$
$-3 \quad -3$
$\frac{-6y}{-6} = \frac{12}{-6}$
$y = -2$

$x = 1 - 3(-2)$
$x = 1 + 6$
$x = 7$

7) $-3x + 3y = 4$
$x = y - 3$

$-3(y - 3) + 3y = 4$
$-3y + 9 + 3y = 4$
$9 = 4$

No solution

Solving Systems of Equations by Elimination Worksheet

1) $-4x-2y=-12$
$4x+8y=-24$

$(6,-6)$

$-4x-2y=-12$
$4x+8y=-24$

$6y=-36$
$\frac{6y}{6}=\frac{-36}{6}$
$y=-6$

$4x+8(-6)=-24$
$4x-48=-24$
$+48 \quad +48$
$\frac{4x}{4}=\frac{24}{4}$ $x=6$

2) $-6x+5y=1$
$6x+4y=-10$

$(-1,-1)$

$-6x+5y=1$
$6x+4y=-10$

$9y=-9$
$\frac{9y}{9}=\frac{-9}{9}$
$y=-1$

$6x+4(-1)=-10$
$6x-4=-10$
$+4 \quad +4$
$\frac{6x}{6}=\frac{-6}{6}$
$y=-1$

3) $x-y=11$
$2x+y=19$

$(10,-1)$

$x-y=11$
$2x+y=19$

$\frac{3x}{3}=\frac{30}{3}$
$x=10$

$10-y=11$
$-10 \quad -10$
$\frac{-y}{-1}=\frac{1}{-1}$
$y=-1$

4) $-4x+9y=9$
$x-3y=-6 \rightarrow 3(x-3y=-6)$

$(9,5)$

$-4x+9y=9$
$3x-9y=-18$

$\frac{-x}{-1}=\frac{-9}{-1}$
$x=9$

$-4(9)+9y=9$
$-36+9y=9$
$+36 \quad +36$
$\frac{9y}{9}=\frac{45}{9}$ $y=5$

5) $5x+y=9 \rightarrow 7(5x+y=9)$
$10x-7y=-18$

$(1,4)$

$35x+7y=63$
$10x-7y=-18$

$\frac{45x}{45}=\frac{45}{45}$
$x=1$

$5(1)+y=9$
$5+y=9$
$-5 \quad -5$
$y=4$

6) $-3x+7y=-16 \rightarrow -3(-3x+7y=-16) \rightarrow$
$-9x+5y=16$

$(-4,-4)$

$9x-21y=48$
$-9x+5y=16$

$\frac{-16y}{-16}=\frac{64}{-16}$
$y=-4$

$-3x+7(-4)=-16$
$-3x-28=-16$
$+28 \quad +28$
$\frac{-3x}{-3}=\frac{12}{-3}$
$x=-4$

7) $16x-10y=10$
$-8x-6y=6 \rightarrow 2(-8x-6y=6) \rightarrow$

$(0,-1)$

$16x-10y=10$
$-16x-12y=12$

$\frac{-22y}{-22}=\frac{22}{-22}$
$y=-1$

$16x-10(-1)=10$
$16x+10=10$
$-10 \quad -10$
$\frac{16x}{16}=\frac{0}{16}$
$x=0$