Solving Systems of Equations by Substitution Worksheet

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

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

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

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

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

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

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

Solving Systems of Equations by Substitution Worksheet

8) $-5x + y = -3$
$3x - 8y = 24$

9) $3x + 8y = -20$
$-5x + y = 19$

10) $-3x + 3y = 3$
$-5x + y = 13$

11) $6x + 6y = -6$
$5x + y = -13$

12) $-3x - 4y = 2$
$3x + 3y = -3$

13) $5x + 8y = -17$
$2x - 7y = -17$

14) $2x - 6y = -6$
$-7x + 8y = -5$

Solving Systems of Equations by Elimination Worksheet

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

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

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

4) $-4x+9y=9$
$x-3y=-6$

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

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

7) $16x-10y=10$
$-8x-6y=6$

Solving Systems of Equations by Elimination Worksheet

8) $-7x - 8y = 9$
$-4x + 9y = -22$

9) $5x + 4y = -30$
$3x - 9y = -18$

10) $-4x - 2y = 14$
$-10x + 7y = -25$

11) $3x - 2y = 2$
$5x - 5y = 10$

12) $5x + 4y = -14$
$3x + 6y = 6$

13) $-14 = -20y - 7x$
$10y + 4 = 2x$

14) $3 + 2x - y = 0$
$-3 - 7y = 10x$

Solving Systems of Equations by Substitution Worksheet

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

(2, 1)

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

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

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)

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

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

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 Substitution Worksheet

8) $-5x + y = -3$
$3x - 8y = 24$

$-5x + y = -3$
$+5x \quad +5x$
$y = 5x - 3$

$3x - 8(5x - 3) = 24$
$3x - 40x + 24 = 24$
$-24 \quad -24$
$\frac{-37x}{-37} = \frac{0}{-37}$
$x = 0$

$-5(0) + y = -3$
$y = -3$

$(0, -3)$

9) $3x + 8y = -20$
$-5x + y = 19$

$-5x + y = 19$
$+5x \quad +5x$
$y = 5x + 19$

$3x + 8(5x + 19) = -20$
$3x + 40x + 152 = -20$
$-152 \quad -152$
$\frac{43x}{43} = \frac{-172}{43}$
$x = -4$

$3(-4) + 8y = -20$
$-12 + 8y = -20$
$+12 \quad +12$
$\frac{8y}{8} = \frac{-8}{8}$
$y = -1$

$(-4, -1)$

10) $-3x + 3y = 3$
$-5x + y = 13$

$-5x + y = 13$
$+5x \quad +5x$
$y = 5x + 13$

$-3x + 3(5x + 13) = 3$
$-3x + 15x + 39 = 3$
$-39 \quad -39$
$\frac{12x}{12} = \frac{-36}{12}$
$x = -3$

$-5(-3) + y = 13$
$15 + y = 13$
$-15 \quad -15$
$y = -2$

$(-3, -2)$

11) $6x + 6y = -6$
$5x + y = -13$

$5x + y = -13$
$-5x \quad -5x$
$y = -5x - 13$

$6x + 6(-5x - 13) = -6$
$6x - 30x - 78 = -6$
$+78 \quad +78$
$\frac{-24x}{-24} = \frac{72}{-24}$
$x = -3$

$5(-3) + y = -13$
$-15 + y = -13$
$+15 \quad +15$
$y = 2$

$(-3, 2)$

12) $-3x - 4y = 2$
$3x + 3y = -3$

$3x + 3y = -3$
$-3x \quad -3x$
$\frac{3y}{3} = \frac{-3x - 3}{3}$
$y = -x - 1$

$-3x - 4(-x - 1) = 2$
$-3x + 4x + 4 = 2$
$-4 \quad -4$
$x = -2$

$-3(-2) - 4y = 2$
$6 - 4y = 2$
$-6 \quad -6$
$\frac{-4y}{-4} = \frac{-4}{-4}$
$y = 1$

$(-2, 1)$

13) $5x + 8y = -17$
$2x - 7y = -17$

$2x - 7y = -17$
$+7y \quad +7y$
$\frac{2x}{2} = \frac{7y - 17}{2}$
$x = 3.5y - 8.5$

$5(3.5y - 8.5) + 8y = -17$
$17.5y - 42.5 + 8y = -17$
$+42.5 \quad +42.5$
$\frac{25.5y}{25.5} = \frac{25.5}{25.5}$
$y = 1$

$2x - 7(1) = -17$
$2x - 7 = -17$
$+7 \quad +7$
$\frac{2x}{2} = \frac{-10}{2}$
$x = -5$

$(-5, 1)$

14) $2x - 6y = -6$
$-7x + 8y = -5$

$2x - 6y = -6$
$+6y \quad +6y$
$\frac{2x}{2} = \frac{6y - 6}{2}$
$x = 3y - 3$

$-7(3y - 3) + 8y = -5$
$-21y + 21 + 8y = -5$
$-13y + 21 = -5$
$-21 \quad -21$
$\frac{-13y}{-13} = \frac{-26}{-13}$
$y = 2$

$2x - 6(2) = -6$
$2x - 12 = -6$
$+12 \quad +12$
$\frac{2x}{2} = \frac{6}{2}$
$x = 3$

$(3, 2)$

Solving Systems of Equations by Elimination Worksheet

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

$(6, -6)$

$-4x - 2y = -12$
$4x + 8y = -24$
$6y = -36$
$y = -6$

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

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

$(-1, -1)$

$-6x + 5y = 1$
$6x + 4y = -10$
$9y = -9$
$y = -1$

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

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

$(10, -1)$

$x - y = 11$
$2x + y = 19$
$3x = 30$
$x = 10$

$10 - y = 11$
$-10 \quad -10$
$-y = 1$
$y = -1$

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

$(9, 5)$

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

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

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

$(1, 4)$

$\rightarrow 7(5x + y = 9) \rightarrow$
$35x + 7y = 63$
$10x - 7y = -18$
$45x = 45$
$x = 1$

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

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

$(-4, -4)$

$\rightarrow -3(-3x + 7y = -16) \rightarrow$
$9x - 21y = 48$
$-9x + 5y = 16$
$-16y = 64$
$y = -4$

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

7) $16x - 10y = 10$
$-8x - 6y = 6$

$(0, -1)$

$\rightarrow 2(-8x - 6y = 6) \rightarrow$
$16x - 10y = 10$
$-16x - 12y = 12$
$-22y = 22$
$y = -1$

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

Solving Systems of Equations by Elimination Worksheet

8) $-7x-8y=9$
$-4x+9y=-22$

$4(-7x-8y=9) \rightarrow -28x-32y=36$
$-7(-4x+9y=-22) \rightarrow 28x-63y=154$
$-95y=190$
$\frac{-95y}{-95}=\frac{190}{-95}$ $y=-2$

$-7x-8(-2)=9$
$-7x+16=9$
$-16 \quad -16$
$-7x=-7$
$\frac{-7x}{-7}=\frac{-7}{-7}$ $x=1$

$(1,-2)$

9) $5x+4y=-30$
$3x-9y=-18$

$9(5x+4y=-30) \rightarrow 45x+36y=-270$
$4(3x-9y=-18) \rightarrow 12x-36y=-72$
$57x=-342$
$\frac{57x}{57}=\frac{-342}{57}$
$x=-6$

$5(-6)+4y=-30$
$-30+4y=-30$
$+30 \quad +30$
$4y=0$
$\frac{4y}{4}=\frac{0}{4}$ $y=0$

$(-6,0)$

10) $-4x-2y=14$
$-10x+7y=-25$

$5(-4x-2y=14) \rightarrow -20x-10y=70$
$-2(-10x+7y=-25) \rightarrow 20x-14y=50$
$-24y=120$
$\frac{-24y}{-24}=\frac{120}{-24}$
$y=-5$

$-4x-2(-5)=14$
$-4x+10=14$
$-10 \quad -10$
$-4x=4$
$\frac{-4x}{-4}=\frac{4}{-4}$
$x=-1$

$(-1,-5)$

11) $3x-2y=2$
$5x-5y=10$

$5(3x-2y=2) \rightarrow 15x-10y=10$
$-3(5x-5y=10) \rightarrow -15x+15y=-30$
$5y=-20$
$\frac{5y}{5}=\frac{-20}{5}$
$y=-4$

$3x-2(-4)=2$
$3x+8=2$
$-8 \quad -8$
$3x=-6$
$\frac{3x}{3}=\frac{-6}{3}$ $x=-2$

$(-2,-4)$

12) $5x+4y=-14$
$3x+6y=6$

$3(5x+4y=-14) \rightarrow 15x+12y=-42$
$-2(3x+6y=6) \rightarrow -6x-12y=-12$
$9x=-54$
$\frac{9x}{9}=\frac{-54}{9}$
$x=-6$

$3(-6)+6y=6$
$-18+6y=6$
$+18 \quad +8$
$6y=24$
$\frac{6y}{6}=\frac{24}{6}$ $y=4$

$(-6,4)$

13) $-14=-20y-7x$
$10y+4=2x$

$-7x-20y=-14$
$2x-10y=4 \rightarrow -2(2x-10y=4)$
$-7x-20y=-14$
$-4x+20y=-8$
$-11x=-22$
$\frac{-11x}{-11}=\frac{-22}{-11}$
$x=2$

$10y+4=2(2)$
$10y+4=4$
$-4 \quad -4$
$10y=0$
$\frac{10y}{10}=\frac{0}{10}$ $y=0$

$(2,0)$

14) $3+2x-y=0$
$-3-7y=10x$

$2x-y=-3$
$10x+7y=-3$
$-3(2x-y=-3) \rightarrow 14x-7y=-21$
$10x+7y=-3$
$24x=-24$
$\frac{24x}{24}=\frac{-24}{24}$
$x=-1$

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

$(-1,1)$