Elimination Practice

1. $x - y = 1$
$+ \quad x + y = -9$

$\frac{2x}{2} = \frac{-8}{2}$

$x = -4$

$x + y = -9$
$-4 + y = -9$
$+4 \quad +4$

$y = -5$

$(-4, -5)$

2. $p + q = -2$
$+ \quad p - q = 8$

$\frac{2p}{2} = \frac{6}{2}$

$p = 3$

$p + q = -2$
$3 + q = -2$
$-3 \quad -3$

$q = -5$

$(3, -5)$

3. $4x + y = 23$
$+ \quad 3x - y = 12$

$\frac{7x}{7} = \frac{35}{7}$

$x = 5$

$4x + y = 23$
$4(5) + y = 23$
$20 + y = 23$
$-20 \quad -20$

$y = 3$

$(5, 3)$

4. $2x + 5y = -3$
$- \quad 2x + 2y = 6$

$\frac{3y}{3} = \frac{-9}{3}$

$y = -3$

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

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$

$(6, -3)$

5. $3x + 2y = -1$
$- \quad 4x + 2y = -6$

$\frac{-x}{-1} = \frac{5}{-1}$

$x = -5$

$3x + 2y = -1$
$3(-5) + 2y = -1$
$-15 + 2y = -1$
$+15 \quad +15$

$\frac{2y}{2} = \frac{14}{2}$

$y = 7$

$(-5, 7)$

6. $5x + 3y = 22$
$- \quad 5x - 2y = 2$

$\frac{5y}{5} = \frac{20}{5}$

$y = 4$

$5x + 3y = 22$
$5x + 3(4) = 22$
$5x + 12 = 22$
$-12 \quad -12$

$\frac{5x}{5} = \frac{10}{5}$

$x = 2$

$(2, 4)$

7. $5x + 2y = 7$
$-2x + 2y = -14$

$\frac{7x}{7} = \frac{21}{7}$

$x = 3$

$5(3) + 2y = 7$
$15 + 2y = 7$
$-15 \quad -15$

$\frac{2y}{2} = \frac{-8}{2}$

$y = -4$

$(3, -4)$

8. $3x - 9y = -12$
$-3x - 15y = -6$

$\frac{-24y}{-24} = \frac{-6}{-24}$

$y = -1$

$3x - 9(-1) = -12$
$3x + 9 = -12$
$-9 \quad -9$

$\frac{3x}{3} = \frac{-21}{3}$

$x = -7$

$(-7, -1)$

9. $-4c - 2d = -2$
$-2c - 2d = -14$

$\frac{-6c}{-6} = \frac{12}{-6}$

$c = -2$

$-4c - 2d = -2$
$-4(-2) - 2d = -2$
$8 - 2d = -2$
$-8 \quad -8$

$\frac{-2d}{-2} = \frac{-10}{-2}$

$d = 5$

$(-2, 5)$

10. $2x - 6y = 6$
$-2x + 3y = 24$

$\frac{-9y}{-9} = \frac{-18}{-9}$

$y = 2$

$2x - 6y = 6$
$2x - 6(2) = 6$
$2x - 12 = 6$
$+12 \quad +12$

$\frac{2x}{2} = \frac{18}{2}$

$x = 9$

$(9, 2)$

11. $7x + 2y = 2$
$-7x - 2y = -30$

$\frac{4y}{4} = \frac{32}{4}$

$y = 8$

$7x + 2(8) = 2$
$7x + 16 = 2$
$-16 \quad -16$

$\frac{7x}{7} = \frac{-14}{7}$

$x = -2$

$(-2, 8)$

12. $4.25x - 1.28y = -9.2$
$+ \quad x + 1.28y = 17.6$

$\frac{5.25x}{5.25} = \frac{8.4}{5.25}$

$x = 1.6$

$4.25(1.6) - 1.28y = -9.2$
$6.8 - 1.28y = -9.2$
$-6.8 \quad -6.8$

$\frac{-1.28y}{-1.28} = \frac{-16}{-1.28}$

$y = 12.5$

$(1.6, 12.5)$

More Challenging

Use elimination to solve each system of equations.

1. $5[x + y = -9]$
$5x - 2y = 32$

$5x + 5y = -45$
$-(5x - 2y = 32)$
$7y = -77$
$y = -11$

$x + y = -9$
$x + (-11) = -9$
$+11 \quad +11$
$x = 2$

$(2, -11)$

2. $3x + 2y = -9$
$2[x - y = -13]$

$+(3x + 2y = -9)$
$2x - 2y = -26$
$5x = -35$
$x = -7$

$x - y = -13$
$-7 - y = -13$
$+7 \quad +7$
$-y = -6$
$y = 6$

$(-7, 6)$

3. $2x + 5y = 3$
$2[-x + 3y = -7]$

$2x + 5y = 3$
$-2x + 6y = -14$
$11y = -11$
$y = -1$

$-x + 3(-1) = -7$
$-x - 3 = -7$
$+3 \quad +3$
$-x = -4$
$x = 4$

$(4, -1)$

4. $2[2x + y = 3]$
$-4x - 4y = -8$

$+(4x + 2y = 6)$
$-4x - 4y = -8$
$-2y = -2$
$y = 1$

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

$(1, 1)$

5. $4x - 2y = -14$
$-2[3x - y = -8]$

$4x - 2y = -14$
$+(-6x + 2y = 16)$
$-2x = 2$
$x = -1$

$3(-1) - y = -8$
$-3 - y = -8$
$+3 \quad +3$
$-y = -5$
$y = 5$

$(-1, 5)$

6. $3[2x + y = 0]$
$5x + 3y = 2$

$6x + 3y = 0$
$-(5x + 3y = 2)$
$x = -2$

$2(-2) + y = 0$
$-4 + y = 0$
$+4 \quad +4$
$y = 4$

$(-2, 4)$

7. $3[5x + 3y = -10]$
$5[3x + 5y = -6]$

$15x + 9y = -30$
$-15x + 25y = -30$
$-16y = 0$
$\frac{-16y}{-16} = \frac{0}{-16}$
$y = 0$

$5x + 3(0) = -10$
$5x + 0 = -10$
$\frac{5x}{5} = \frac{-10}{5}$
$x = -2$

$(-2, 0)$

8. $4[2x + 3y = 14]$
$3[3x - 4y = 4]$

$8x + 12y = 56$
$+ \; 9x - 12y = 12$
$\frac{17x}{17} = \frac{68}{17}$
$x = 4$

$2(4) + 3y = 14$
$8 + 3y = 14$
$-8 \quad -8$
$\frac{3y}{3} = \frac{6}{3}$
$y = 2$

$(4, 2)$

9. $-2[2x - 3y = 21]$
$3[5x - 2y = 25]$

$-4x + 6y = -42$
$+ \; 15x - 6y = 75$
$\frac{11x}{11} = \frac{33}{11}$
$x = 3$

$2(3) - 3y = 21$
$6 - 3y = 21$
$-6 \quad -6$
$\frac{-3y}{-3} = \frac{15}{-3}$
$y = -5$

$(3, -5)$

10. $5[3x + 2y = -26]$
$2[4x - 5y = -4]$

$15x + 10y = -130$
$+ \; 8x - 10y = -8$
$\frac{23x}{23} = \frac{-138}{23}$
$x = -6$

$3(-6) + 2y = -26$
$-18 + 2y = -26$
$+18 \quad +18$
$\frac{2y}{2} = \frac{-8}{2}$
$y = -4$

$(-6, -4)$

11. $2[3x - 6y = -3]$
$3[2x + 4y = 30]$

$6x - 12y = -6$
$+ \; 6x + 12y = 90$
$\frac{12x}{12} = \frac{84}{12}$
$x = 7$

$3(7) - 6y = -3$
$21 - 6y = -3$
$-21 \quad -21$
$\frac{-6y}{-6} = \frac{-24}{-6}$
$y = 4$

$(7, 4)$

12. $3[5x + 2y = -3]$
$-2[3x + 3y = 9]$

$15x + 6y = -9$
$+ \; -6x - 6y = -18$
$\frac{9x}{9} = \frac{-27}{9}$
$x = -3$

$3(-3) + 3y = 9$
$-9 + 3y = 9$
$+9 \quad +9$
$\frac{3y}{3} = \frac{18}{3}$
$y = 6$

$(-3, 6)$