Name: Key

Solve the system of equation by using linear combination (elimination). Show all of your work!

1) $-2x + 4y = 12$
$2x + 6y = 8$

$10y = 20$
$y = 2$

$2x + 6(2) = 8$
$2x + 12 = 8$
$x = -2$

$(-2, 2)$

$-2(-2) + 4(2) = 12$
$4 + 8 = 12$
$12 = 12$

$2(-2) + 6(2) = 8$
$-4 + 12 = 8$
$8 = 8$

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

rearrange: $x + 5y = 2$

$4x = 8$
$x = 2$

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

$(2, 0)$

$3(2) + 5(0) = 6$
$6 = 6$

$-5(0) + (2) = 2$
$2 = 2$

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

$+x \quad +x$

$+ \; x + 7 = 6y$
$-x + 1 = 2y$

$8 = 8y$
$y = 1$

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

$(-1, 1)$

$7 = -(-1) + 6(1)$
$7 = 7$

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

4) $3y - 5x = 8$
$5x + 2y = 7$

rearrange: $-5x + 3y = 8$
$+ \; 5x + 2y = 7$

$\frac{5y}{5} = \frac{15}{5}$
$y = 3$

$5x + 2(3) = 7$
$5x = 1$
$x = \frac{1}{5}$

$\left(\frac{1}{5}, 3\right)$

$3(3) - 5\left(\frac{1}{5}\right) = 8$
$9 - 1 = 8$
$8 = 8$

$5\left(\frac{1}{5}\right) + 2(3) = 7$
$1 + 6 = 7$
$7 = 7$

5) $5x - 4y = 3$
$2x + 8y = -18$

$+ \; 10x - 8y = 6$

$12x = -12$

$x = -1$

$(-1, -2)$

$2(-1) + 8y = -18$

$-2 + 8y = -18$

$8y = -16$

$y = -2$

$5(-1) - 4(-2) = 3$

$-5 + 8 = 3$

$3 = 3$ ✓

$2(-1) + 8(-2) = -18$

$-18 = -18$ ✓

6) $-x + 3y = 6$
$3x + 6y = 12$

$-3x + 9y = 18$

$15y = 30$

$y = 2$

$(0, 2)$

$-x + 3(2) = 6$

$x = 0$

$-(0) + 3(2) = 6$

$6 = 6$ ✓

$3(0) + 6(2) = 12$

$12 = 12$ ✓

7) $3x - 4y = 7$
$-4[2x - y = 3]$

$+ \; -8x + 4y = -12$

$-5x = -5$

$x = 1$

$(1, -1)$

$3(1) - 4y = 7$

$-4y = 4$

$y = -1$

$3(1) - 4(-1) = 7$

$7 = 7$ ✓

$2(1) - (-1) = 3$

$3 = 3$ ✓