11/30 Algebra 1 - Downing

5.3 A Systems by Elimination

Steps

1. Align variables on top of each other.
2. Multiply 1 or both equations so that one variable has opposite coefficients
3. Add straight down to eliminate one variable. Solve for the other
4. Substitute the value from step 3 into one of the original equations to solve for the other variable
5. Answer with ordered pair

Example

1. $-7x - 7y = 7$
2. $\rightarrow -63x - 63y = 63$
3. $4x + 9y = 6 \rightarrow 28x + 63y = 42$

$-35x = 105$

$\frac{-35x}{-35} = \frac{105}{-35}$

$x = -3$

4. $4(-3) + 9y = 6$

$-12 + 9y = 6$

$+12 \quad +12$

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

$y = 2$

5. $(-3, 2)$

$5 + 2 = 7$ ✓

$4 + 4 = 8$ ✓

$9 + 6 = 15$ ✓

$5 + 3 = 8$ ✓

$5 - 3 = 2$ ✓

$10 = 10$ ✓

$x = 5$ ✓

$+ 2x = 10$ ✓

$3x = 15$ ✓

Ex) 3. $(2x + 3y = 29) \rightarrow 6x + 9y = 87$

2. $(-3x - 2y = -26) \rightarrow -6x - 4y = -52$

$\frac{5y}{5} = \frac{35}{5}$

$y = 7$

plug in

$2x + 3y = 29$

$2x + 3(7) = 29$

$2x + 21 = 29$

$-21 \quad -21$

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

$x = 4$

$(4, 7)$

Ex) $10(10x - 9y = -21) \rightarrow 100x - 90y = -210$

$9(3x + 10y = -19) \rightarrow 27x + 90y = -171$

$\frac{127x}{127} = \frac{-381}{127}$

$x = -3$

$3(-3) + 10y = -19$

$-9 + 10y = -19$

$+9 \quad +9$

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

$y = -1$

$(-3, -1)$

Ex) $-3y + x = 24 \rightarrow -3(x - 3y = 24) \rightarrow -3x + 9y = -72$

$3x + y = 12 \quad 3x + y = 12 \rightarrow 3x + y = 12$

$\frac{10y}{10} = \frac{-60}{10}$

$y = -6$

$3x - 6 = 12$

$+6 \quad +6$

$\frac{3x}{3} = \frac{18}{3}$

$x = 6$

$(6, -6)$

HW Big Ideas Math

Exercise 5.3 – 3 problems

#14, 15, 16