Section 3.4 Solving Equations with Variables on Both Sides

To solve equations with variables on both sides, we can add or subtract to get all of the variables "collected" on one side.

Example: $3x + 5 = 2x + 7$

I like to collect all of my variables in such a way as to keep the coefficients positive. So I would choose to subtract 2x from both sides as my first step.

$3x + 5$	$=$	$2x + 7$	
$-2x$		$-2x$	Subtract 2x from both sides
$x + 5$	$=$	7	
-5		-5	Subtract 5 from both sides
$\mathbf{x}$	$\mathbf{=}$	$\mathbf{2}$	

Example: $-2x + 12 = 7x + 3$

$-2x + 12$	$=$	$7x + 3$	
$+2x$		$+2x$	Keep the coefficient positive by adding 2x to both sides.
12	$=$	$9x + 3$	
-3		-3	Subtract 5 from both sides
9	$=$	$9x$	
$/9$	$=$	$/9$	Divide both sides by 9
1	$=$	x	
$\mathbf{x}$	$\mathbf{=}$	$\mathbf{1}$	Reverse the operation to get the variable on the left