Solving Equations – The Collecting Method | MFM2P

To solve equations with a variable on each side will require us to use the **collecting method**. We use the same ideas from the previous days (opposite operations), but now we have to "collect" the x-terms as well as the constant terms.

Let's see how this works with the examples below. Mr. Smith has given you a lot of structure for the first couple, and then we will remove the structure.

Equation:	$6x + 2 = 4x + 10$
Collect the variable terms:	$-4x \quad -4x$ $2x + 2 = 10$
Collect the constant terms:	$-2 \quad -2$ $2x = 8$
Divide:	$\frac{2x}{2} = \frac{8}{2}$ $x = 4$
Am I Right?	Does $6(4) + 2 = 4(4) + 10$? $24 + 2 = 16 + 10$ $26 = 26$ ✓✓

Equation:	$57 + 11x = 7x + 73$
Collect the variable terms:	$-7x \quad -7x$ $57 + 4x = 73$
Collect the constant terms:	$-57 \quad -57$ $4x = 16$
Divide:	$\frac{4x}{4} = \frac{16}{4}$ $x = 4$
Am I Right?	Does $57 + 11(4) = 7(4) + 73$? $57 + 44 = 28 + 73$ $101 = 101$

Solving Equations by Collecting Like Terms | MFM2P

You try this one:

Equation:	$7x + 3 = 2x + 38$
Collect the variable terms:	$-2x \quad -2x$ $5x + 3 = 38$
Collect the constant terms:	$-3 \quad -3$ $5x = 35$
Divide:	$\frac{5x}{5} = \frac{35}{5}$ $\boxed{x = 7}$
Am I Right?	Does $7(7) + 3 = 2(7) + 38$ $49 + 3 = 14 + 38$ $52 = 52$ ✓

Each of the three previous problems could be modeled with a scale diagram because all of the numbers were positive, and the answer was positive as well. The following cannot, but we can still solve them using opposite operations, and the collecting method.

a) $7x - 22 = 5x - 10$

$-5x \quad -5x$

$2x - 22 = -10$

$+22 \quad +22$

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

$\boxed{x = 6}$

b) $1 + 5x = 3x - 3$

$-3x \quad -3x$

$1 + 2x = -3$

$-1 \quad -1$

$\frac{2x}{2} = \frac{-4}{2}$

$\boxed{x = -2}$