## Lesson 5: Steps in Solving Equations

* Let’s recall steps in solving equations

### 5.1: Explaining Equivalent Expressions

Explain or show why each of these equations is equivalent to $7\left(x−15\right)+3=8$.

1. $7x−105+3=8$
2. $7\left(x−15\right)−5=0$
3. $7x−102−8=0$

### 5.2: Checking Work

Here is Clare’s work to solve some equations. For each problem, do you agree or disagree with Clare’s work? Explain your reasoning.

1. $2\left(x−1\right)+4=3x−2$
$2x−2+4=3x−2$
$2x+2=3x−2$
$2x=3x$
$-x=0$
$x=0$
2. $3\left(x−1\right)=5x+6$
$3x−1=5x+6$
$-1=2x+6$
$-7=2x$
$−3.5=x$
3. $\left(x−2\right)\left(x+3\right)=x+10$
$x^{2}+x−6=x+10$
$x^{2}−6=10$
$x^{2}=16$
$x=4$

### 5.3: Row Game: Rewriting Equations

Work independently on your column. Partner A completes the questions in column A only and partner B completes the questions in column B only. Your answers in each row should match. Work on one row at a time and check if your answer matches your partner’s before moving on. If you don’t get the same answer, work together to find any mistakes.

Partner A: Write an equivalent equation so that the given condition is true.

1. $5x+10=−35$
	* The expression on the right side is 0
2. $x^{2}−9x=42$
	* The left side is a product
3. $x\left(x+3\right)+9=1$
	* The right side is 0
4. $8\left(x+1\right)=5x$
	* The left side is 0 and there are no parentheses
5. $11+x=\frac{12}{x}$
	* The equation is quadratic and the right side is zero.
6. $\left(3x−5\right)\left(x−2\right)=0$
	* One side of the equation has a term with $3x^{2}$
7. $4x^{2}−4=8$
	* The right side is 0 and the left side is a product

Partner B: Write an equivalent equation so that the given condition is true.

1. $5\left(x+9\right)=0$
	* The left side is expressed as the sum of two terms
2. $x\left(x−9\right)−42=0$
	* The left side is a product and the right side is not 0
3. $x\left(x+3\right)+6=−2$
	* The right side is 0
4. $3x=−8$
	* The left side is 0
5. $\left(x+12\right)\left(x−1\right)=0$
	* The left side involves $x^{2}$
6. $3x−11=\frac{10}{x}$
	* One side of the equation has a term with $3x^{2}$
7. $4\left(x^{2}−1\right)=8$
	* The right side of is 0 and the left side is a product



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