EQUATIONS

STEPS

1. **Multiply signed number** *touching* left parenthesis (if any) with each term inside.
   a. If only a negative sign '−' touches left parenthesis, *distribute* the '−' inside of parentheses by changing the sign of each term to its opposite sign.
2. **Collect like terms** (if any) on the *same side* of the equals sign.
   a. Left side: collect like terms, variable terms (x-terms) or constant terms (numbers).
   b. Right side: collect like terms, as above.
3. **Move x-term** (if any) from the right of the equals sign to the left.
   a. Mentally note the current sign ('+' or '−') of that x-term.
   b. Change that x-term's sign to its opposite to move it to the left.
      i. Right side: x-term 'zeroes-out' and is gone.
      ii. Left side: collect x-term already on the left (if any) with the x-term moved from right.
4. **Move constant term** (if any) from the left of the equals sign to the right.
   a. Mentally note the current sign ('+' or '−') of that constant term.
   b. Change that constant term's sign to its opposite to move it to the right.
      i. Left side: constant term 'zeroes-out' and is gone.
      ii. Right side: collect constant term already on the right (if any) with the constant term moved from left.
5. **Divide by coefficient of x** (including its sign) to get x by itself on the left.
   a. Left side: coefficient 'cancels' (becomes 1), which leaves x by itself.
   b. Right side: divide number by coefficient of x, which results in the answer.

NOTES

- *GOAL:* Move x's to the left and move constants to the right, until you have: **x = #**.
- Use pencil so any mistakes can be erased.
- *Left* or *right* refers to the *left side* or *right side* of the equals sign '='.
- *Before* writing anything on paper, *think* about the goal for that step.
  o *After* you mentally commit to the correct action, *then* write it down.
- Do not write two or more steps on one line. Instead, write each step on a new line, keeping the equals sign lined up vertically under the previous line.
- Optionally, check your answer by substituting the result into all x's of original equation to verify that the numerical value of the left side equals the right side.

Solve:

$$-6(x + 1) + 12 = 11 - (x - 5)$$

STEP 1: Multiply signed number *touching* left parenthesis with each term inside.

STEP 1: If only a '−' touches left parenthesis, change sign of each term to its opposite.

$$-6x - 6 + 12 = 11 - x + 5$$

STEP 2: Collect like terms on the *same side* of the equals sign.

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$$-6x + 6 = -x + 16$$

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$$+x \qquad = +x$$

STEP 3: Move *x*-term from the right of the equals sign to the left. Sign of *x*-term was '−' so write its opposite '+' below *x*-term.

STEP 3: To keep equation balance, *copy & paste* the '+x' to the left side under the like term '−6x'. On right, *x*-term 'zeroes-out'. On left, the '+x' is combined with '−6x' to get '−5x'.

$$-5x + 6 = 16$$

STEP 4: Move constant term from the left of the equals sign to the right. Sign of constant term was '+' so write its opposite '−' below constant term.

$$-5x + 6 = 16$$
$$-6 = -6$$

STEP 4: To keep equation balance, *copy & paste* the '−6' to the right side under the like term '16'. On left, constant term 'zeroes-out'. On right, the '−6' is combined with '16' to get '10'.

$$-5x = 10$$

STEP 5: Divide by coefficient of *x* (including its sign) to get *x* by itself on the left. Use the division bar to specify division. *Do not* divide by *x* also.

$$\frac{-5x}{-5} = \frac{10}{-5}$$

STEP 5: To keep equation balance, *copy & paste* the division by '−5' to the right side under the '10'. On left, the '−5' coefficient 'cancels' (becomes 1), which leaves *x* by itself. On right, the '10' is divided by '−5' which results in the answer of '−2'.

$$x = -2$$

NOTES:
• Goal completed since we have the form: *x* = #.
• Sometimes the answer is a reduced fraction.