Solving Linear Equations with a Variable on Only One Side of the Equation

In this section we use all the tools we have learned so far: removing parentheses, combining like terms, the addition property of equality, and the multiplication property of equality.

Steps to solving:
1) If fractions are present, multiply both sides of the equation by the LCD (least common denominator). After you are done multiplying by the LCD the equation will no longer have fractions.
2) Use the distributive property to ________________ ____________________.
3) ________________ like terms that are on the _____ side of the equal sign.
4) Use the Addition Property to get constant terms (numbers) on ______ side of the equation and the variable terms on the _______ _______ of the equation. In this step you are adding or subtracting both sides of the equation by the same amount to move the term from one side of the equation to the other. By the time you are done with this step the equation will look like ax=b.
5) Use the Multiplication Property to ______________ the variable; that is, to get it to look like x = # or # = x. This is done by dividing both sides of the equation by the coefficient.
6) Check the value you found by plugging it into the original equation. If you get the same value on both sides of the equal sign, the value you found is the solution to the equation. If you get different values, then the value you found is not a solution...look over your work.

Examples: Solve.
1) Want to get equation to look like: ax = b. You choose what side of the equation is the ‘variable side’ and which side is the ‘constant’ side.

\[2x - 4 = 8\]  
Check:

2) \[9 = 12 - w\]  
3) \[-2(x + 8) - 5 = 1\]  
Check:
4) \( \frac{2}{3}(n - 3) = 8 \)  
5) \( \frac{5}{8} = \frac{5t}{6} + 2 \)

Now you try: Solve.

6) \(-5t - 4 = 11\)  
7) \(2x - 6(x + 8) = 10\)

8) \(11 = x - 3(2x + 3)\)  
9) \(\frac{3}{4}(x - 5) = -12\)

10) \(\frac{1}{2}r + \frac{1}{5}r = 7\)  
11) \(\frac{4x - 1}{3} = 12\)