Balancing Equations, pt.2

(clearing constants)

Suppose you have the equation $3x = 21$.
Is there a way to solve this by balancing the equation? Yes, there is. Now, you may already know the answer to the above equation, but here is a method to solve such problems.

Recall, that a number has a reciprocal, such that when the two are multiplied together, they equal one.

Ex. 3 and ⅓ are reciprocals
Because $3 \cdot ⅓ = 3/3 = 1$

Ex. 2/5 and 5/2 are reciprocals because:
$2/5 \cdot 5/2 = 10/10 = 1$

Using this information, we can balance the first equation by multiplying both sides by the reciprocal of the coefficient in front of the variable.
So, $3x = 21$
$(1/3)3x = (1/3)21$
$(3/3)x = (21/3)$
$x = 7$

ex. $(5/3)x = 15$
$(3/5)(5/3)x = (3/5)15$
$1x = 45/5$
$x = 9$

ex. $(1/5)x = a + b$
$(5/1)(1/5)x = (5/1)(a + b)$ ← simplify, distribute
$x = 5a + 5b$

exercises:

1.) $(3/5)x = 15$
2.) $7x = 21$
3.) $(12/3)x = 6$
4.) $(2/3)x = 4$
5.) $(3/5)x = 9$
6.) $(4/8)x = 8$
7.) $(7/2)x = 14$
8.) $(6/4)x = 12$
9.) $(5/3)x = 5$
10.) $(1/2)x = 2$