More Equations

Example 1. First, simplify $3x + 4x$ on the right side. We do this so that we will get a SINGLE term with x, not several.

$$3x + 4x = 35$$

Now, divide both sides by 7.

$$7x = 35 \quad | \div 7$$

Here is the final solution.

$$x = 5$$

Check by substituting 5 into the original equation: $3 \cdot 5 + 4 \cdot 5 = 15 + 20 = 35$. Yes, it is correct.

1. Solve these equations. First, simplify what is on the left side.

a. $\quad 2y + 5y = 49$	**b.** $\quad 10x - 8x = 42$	**c.** $\quad 7a + 2a - 5a = 52$
$=$	$=$	$=$
$=$	$=$	$=$
$=$	$=$	$=$

Example 2. First, simplify $45 + 18$ on the right side.

$$35 + x = 45 + 18$$

Now, subtract 35 from both sides.

$$35 + x = 63 \quad | - 35$$

35 and -35 cancel each other.

$$35 + x - 35 = 63 - 35$$

Here is the final solution.

$$x = 28$$

Check: is $35 + 28$ equal to $45 + 18$? Yes, it is.

2. Solve these equations. First, simplify (calculate) what is on the right side.

a. $\quad y \div 400 = 6 + 2$	**b.** $\quad z - 220 = 3 \cdot 100$	**c.** $\quad 8x = 501 + 59$
$=$	$=$	$=$
$=$	$=$	$=$
$=$	$=$	$=$

3. Solve these equations. First, simplify what is on the left side and what is on the right side. Then solve.

a. $\quad 2x + 3x = 29 - 14$	**b.** $\quad 7c - c = 3 \cdot 80$	**c.** $\quad 14x - 6x + 2x = 5 \cdot 40$
$=$	$=$	$=$
$=$	$=$	$=$
$=$	$=$	$=$

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4. Simplify the expressions by adding or subtracting like terms.

a. $4y + 10 + 5y$	**b.** $12a^2 - 8a^2$
c. $20s - 4s + 9 + 12s$	**d.** $2y + 5x - 2x + 8y$
e. $9mn + 9 + 3 - 2mn$	**f.** $16w + 15y + 10x - 2w - 7x$

The perimeter of a square with an unknown side length is 486 m. How long is its side?

This is an easy problem, but let's use it to learn to write equations! To write an equation for this problem, we need to first find what "thing" is unknown, and choose a variable for it.

The unknown is the length of the side. Let's choose *s* to represent that.

The equation we write needs to match this sentence: "The perimeter of a square is 486." The word "is" actually corresponds to the equals sign in our equation! So we just need to write an expression that uses our variable *s* for "the perimeter of a square."

That's easy: Since the perimeter of a square with side *s* is 4*s* (why?), the equation we want is 4*s* = 486.

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5. Write an equation for each situation (even if you could easily solve the problem without an equation). Then solve the equation.

a. The value of a certain number of nickels is 485 cents. How many nickels are there?
Hint: First choose a variable to represent the number of nickels.

b. The total cost of 25 buckets is $112.50 . How much does one bucket cost?
Hint: choose a variable to represent what is asked (what is not known).

c. Ann is 16 1/2 years younger than Elizabeth. When Elizabeth is 89 years old, how old will Ann be?
Hint: choose a variable to represent what is asked (what is not known).

d. The area of a square is 169 square feet. How long is its side?
Hint: to solve the equation you get, guess and check.

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