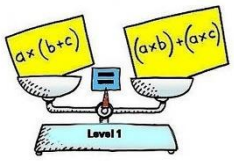
Grade 8 - Mathematics

Algebraic Equations 1

Memo



A. Convert the following word statements into algebraic equations. You do not need to solve the equations:

1. Multiply a number by four and the answer is twenty.
   $4x = 20$

2. Add eighty-three to a number and the answer is one hundred.
   $83 + x = 100$

3. A number to the power of 2 is forty-nine.
   $x^2 = 49$

B. Calculate the value of x:

1. $2x + 5 = 21$

   Check by substitution

   $2x + 5 - 5 = 21 - 5$ — $2(8) + 5 = 21$
   $2x = 16$ — $16 + 5 = 21$
   $2x \div 2 = 16 \div 2$ — $21 = 21$
   $x = 8$

2. $12 + 9x = 30$

   $12 + 9x - 12 = 30 - 12$ — $12 + 9(2) = 30$
   $9x = 18$ — $12 + 18 = 30$
   $9x \div 9 = 18 \div 9$ — $30 = 30$
   $x = 2$

3. $30 - 2x = 40$

   $30 - 2x - 30 = 40 - 30$ — $30 - 2(-5) = 40$
   $-2x = 10$ — $30 + 10 = 40$
   $-2x \div -2 = 10 \div -2$ — $40 = 40$
   $x = -5$

C. Calculate the value of x:

Check by substitution

1. $2x - 1 = 3x - 6$

$2x - 1 + 1 = 3x - 6 + 1$

$2x = 3x - 5$

$2x - 3x = 3x - 5 - 3x$

$-x = -5$

$x = 5$

$2(5) - 1 = 3(5) - 6$

$10 - 1 = 15 - 6$

$9 = 9$

2. $x + 4 = 2x + 5$

$x + 4 - 4 = 2x + 5 - 4$

$x = 2x + 1$

$x - 2x = 2x + 1 - 2x$

$-x = 1$

$x = -1$

$-1 + 4 = 2(-1) + 5$

$3 = -2 + 5$

$3 = 3$

3. $7x + 9 = 4x + 30$

$7x + 9 - 9 = 4x + 30 - 9$

$7x = 4x + 21$

$7x - 4x = 4x + 21 - 4x$

$3x = 21$

$3x \div 3 = 21 \div 3$

$x = 7$

$7(7) + 9 = 4(7) + 30$

$49 + 9 = 28 + 30$

$58 = 58$