

Coefficient - the number in front of the variable tells how many of the variable you have

Coefficient



Variable



operation



2

a

-5

Constant

Write an expression where:

Coefficient is 4
Variable is t
Operation is -
Constant is 9

Variable is a letter that
represents a number
Coefficient is a number being

Writing Expressions

"How do you translate algebraic exp?"

Components of algebraic Exp.

algebraic expression

Coefficient - number in front of the variable

Constant - terms w/ numbers only

Variable - letter used to represent unknown number

$$a \text{ divided by } b = a \div b = \frac{a}{b}$$

Algebraic Exp is a mathematical expression that has variables, numbers, and operations

$$1.3y - \frac{5}{6}x + 15$$

$\frac{3}{4}$ more than an unknown number

an unknown increased by $\frac{3}{4}$

$$13.47 - y$$

an unknown number subtracted from 13.47

13.47 minus an unknown number

13.47 decreased by an unknown number

the difference between 13.47 and some number

multiply

6x

Six times a number

the product of six and some number

division

$\frac{y}{4}$

the quotient of a number and four

Some number split into four pieces

multiple ops

$$1.8y - \frac{5}{9}(x-11)$$

the product of 1.8 and a number minus $\frac{5}{9}$ times
the quantity of an unknown number minus 11.

$$-\frac{1}{6} + 3x - 2y$$

$-\frac{1}{6} + 3$ times a number minus the product
of 2 and another number

words
to
algebra

words to algebra

3 times the sum of a number and $\frac{8}{3}$
 $3(x + \frac{8}{3})$

-1.7 less than $\frac{1}{2}$ of a number
 $\frac{1}{2}m - (-1.7)$ or
 $\frac{m}{2} - (-1.7)$

three fourths of the difference of a number and 9
 $\frac{3}{4}(x - 9)$
↓
Parentheses

the quotient of a number and 15
 $\frac{y}{15}$ or $y \div 15$

Real-World

Jill ran a certain number of miles on Monday. On Tuesday, Jill ran 5.3 miles farther than three times what she did on Monday. Represent the miles Jill ran on Tuesday as an algebraic expression.

Let Monday = x (than)
 $3x + 5.3$ on Tuesday

Paul exercises h hours a day for 5 days. Over the weekend, he exercises a total of 4.5 hours. What expression represents the number of hours Paul exercises in a full week?

$5h + 4.5$

Writing Complex Expressions

the city is building a parking lot for an office building. The parking lot should have 4 rows for cars, but due to the shape of the lot, each row will have a different number of spots. The second row will have half as many spots as the first row. The third row will have two fewer spots than the second, and the fourth row will have four fewer than the 2nd row.

$$x = 1\text{st row} \quad 2\text{nd row} = \frac{1}{2}x \text{ (or) } \frac{x}{2}$$

$$3\text{rd row} = \frac{x}{2} - 2 \quad 4\text{th row} = \frac{x}{2} - 4$$

$$x + \left(\frac{x}{2}\right) + \left(\frac{x}{2} - 2\right) + \left(\frac{x}{2} - 4\right)$$

$$\frac{2x}{2} + \frac{x}{2} + \frac{x}{2} + \frac{x}{2} - 2 - 4$$

$$\frac{5x}{2} - 6, \text{ let } x = 10$$

$$\frac{5(10)}{2} - 6 = \frac{50}{2} - 6 = 25 - 6 = 19$$

$$\frac{5x}{2} - 6 = \frac{5(30)}{2} - 6 = \frac{150}{2} - 6 = 75 - 6 = 69$$

$$-\frac{5}{6}x + 7; x = 9 \quad -\frac{5}{6}(9) + 7 = -\frac{45}{6} + 7 = -\frac{45}{6} + \frac{42}{6} = -\frac{3}{6} = -\frac{1}{2}$$

What expression represents the total number of spots?

Writing & Evaluating Expressions

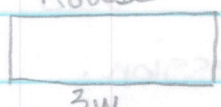
How can you use expressions to solve a real-world problem?

Marissa is building a rectangular garden behind her house. She wants to use the house as one side of the garden for shade, and the length of the house should be 3 times the width of the garden. Write an algebraic expression that will model the amount of fencing Marissa will require.

Strat 2

Question - How much fencing will Marissa need?

Clues - $l = 3 \times \text{width}$

Strategy - w  $w = \text{width}$

Check - $w + 3w + w \Rightarrow 5w$

Marissa found the expression $5w$ for fencing. She already has 52 ft of fencing, what is the largest width she can have for her garden?

Evaluate using a width of 1 ft.

$$52 - 5w \quad L + w = 1$$

$$52 - 5(1) = 47$$

Substitute $\Rightarrow 52 - 5(4) = 52 - 20 = 32$

$$52 - 5(8) = 52 - 40 = 12$$

$$52 - 5(7) = 52 - 35 = 17$$

$$52 - 5(9) = 52 - 45 = 7$$

$$52 - 5(10) = 52 - 50 = 2$$

$$52 - 5(11) = 52 - 55 = -3$$

Writing & Evaluating Division Expressions

Muriel bought 8 pizzas for his baseball team to share equally after the game.

If each pizza has 6 slices, how many slices will each player receive?

$$p = \# \text{ players} \quad \frac{8(6)}{p} \Rightarrow \frac{48}{p}; \text{ Let } p = 11$$
$$\frac{48}{11} = 4 \frac{4}{11}$$

Evaluate Expressions with given values

A truck driver covers 63.5 miles per hour for x miles. Along the way, the driver accidentally took a wrong turn and lost 33.5 miles. If the driver spent 6 hours on the road, how far did she travel in the correct direction?

① Write an expression.

$$63.5x - 33.5$$

② Evaluate the expression.

$$\text{Let } x = 6 \quad 63.5(6) - 33.5 = 381 - 33.5$$
$$= 347.5$$

③ answer question

She traveled 347.5 miles in the correct direction