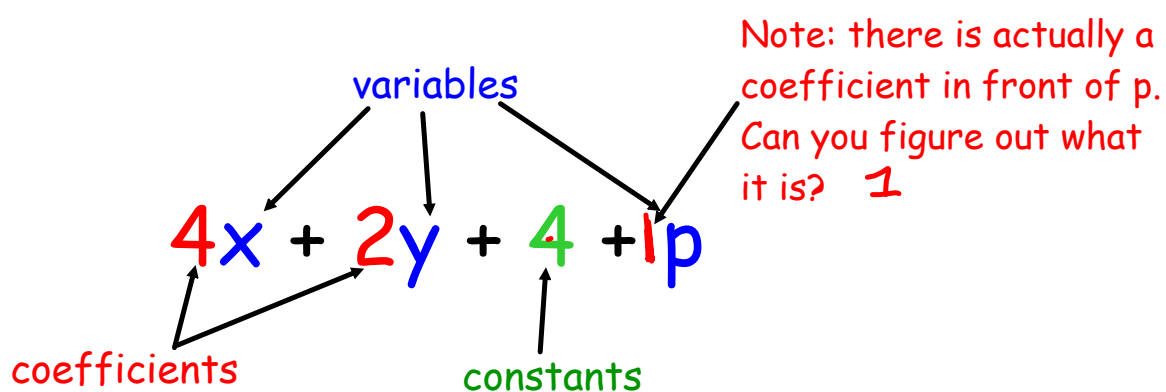


Algebra 1
2.1 Modeling with Expressions

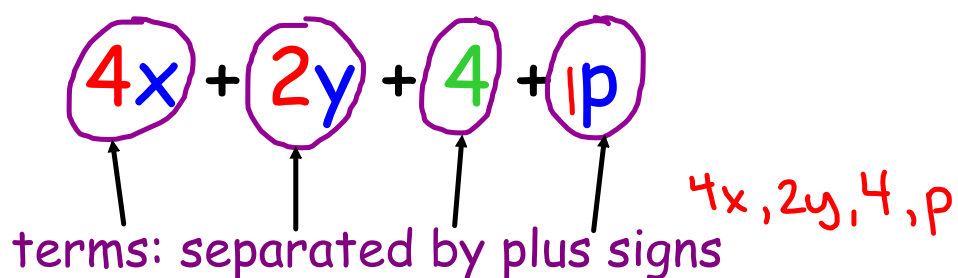
Expressions: contain variables, numbers and at least one operation.



coefficients: Numbers in front of variables 4, 2, 1

variables: letters x, y, p

constants: the numbers by themselves 4



Ex 1) List the coefficients, variables, terms and constants.

$$8 + 2y - 1w - 6$$

(8) + (2y) + (-1w) + (-6)

coefficients: 2, -1

variables: y, w

constants: 8, -6

terms: 8, 2y, -1w, -6

Ex 2) List the coefficients, variables and constants.

$$6x + 4 + 2r + 1$$

coefficients:

variables:

constants:

Ex 2) List the coefficients, variables, terms and constants.

$$-9y + 2 + 7x - h$$

$(-9y) + (2) + (7x) + (-h)$

coefficients: $-9, 7, -1$

variables: y, x, h

constants: 2

terms: $-9y, 2, 7x, -1h$

You Try:

Ex 3) List the coefficients, variables, constants, and terms

$$7r - 5w - 6 - s$$

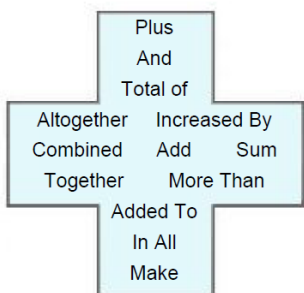
coefficients: 7, -5, -1

variables: r, w, s

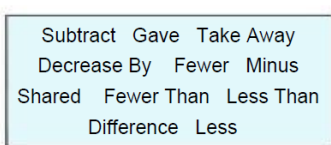
constants: -6

terms: 7r, -5w, -6, -s

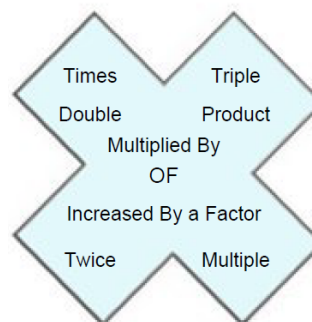
Addition



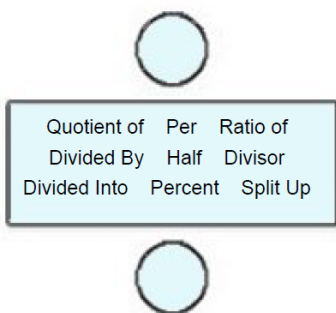
Subtraction



Multiplication



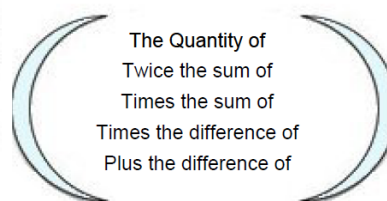
Division



Equals



Parenthesis Words



Explain 1 Interpreting Algebraic Expressions in Context

In many cases, real-world situations and algebraic expressions can be related. The coefficients, variables, and operations represent the given real-world context.

Interpret the algebraic expression corresponding to the given context.

Example 1

- (A) Curtis is buying supplies for his school. He buys p packages of crayons at \$1.49 per package and q packages of markers at \$3.49 per package. What does the expression $1.49p + 3.49q$ represent?

$1.49p$ the price of p packages of crayons

$3.49q$ the price of q packages of markers

$1.49p + 3.49q$: total price of crayons & markers

- (B) Jill is buying ink jet paper and laser jet paper for her business. She buys 8 more packages of ink jet paper than p packages of laser jet paper. Ink jet paper costs \$6.95 per package and laser jet paper costs \$8 per package. What does the expression $8p + 6.95(p + 8)$ represent?

$8p$: cost for p packs of laser paper

$p+8$: # of inkjet paper packs

$6.95(p+8)$: total cost for all ink jet packs

$8p + 6.95(p+8)$: total cost for both kinds of paper

Example 3 Write an algebraic expression to model the given context. Give your answer in simplest form.

(A) the price of an item plus 6% sales tax

$$1x + .06x = 1.06x$$

100%

$$25 + 25 \cdot .06$$

$$3(25 + \$1.50 \text{ in tax})$$

26.50

$$x(1 + .06) = 1.06x$$

(B) the price of a car plus 8.5% sales tax

$$1c + .085c$$

$$1.085c$$

Reflect

7. Use the Distributive Property to show why $p + 0.06p = 1.06p$.

$$p(1 + .06) = p \cdot 1.06 = 1.06p$$

8. What could the expression $3(p + 0.06p)$ represent? Explain.

buying 3 items

Your Turn

Interpret the algebraic expression corresponding to the given context.

3. George is buying watermelons and pineapples to make fruit salad. He buys w watermelons at \$4.49 each and p pineapples at \$5 each. What does the expression $4.49w + 5p$ represent?

total cost of watermelons & pineapple

4. Sandi buys 5 fewer packages of pencils than p packages of pens. Pencils costs \$2.25 per package and pens costs \$3 per package. What does the expression $3p + 2.25(p - 5)$ represent?

total cost of pens & pencils

Your Turn

Write an algebraic expression to model the given context. Give your answer in simplest form.

9. the number of gallons of water in a tank, that already has 300 gallons in it, after being filled at 35 gallons per minute for m minutes

each

$$300 + 35m$$

10. the original price p of an item less a discount of 15%

$$p - .15p = (100\% - 15\%)p = 85\% \cdot p = \boxed{.85p}$$

Explain 2 Comparing Algebraic Expressions

Given two algebraic expressions involving two variables, we can compare whether one is greater or less than the other. We can denote the inequality between the expressions by using $<$ or $>$ symbols. If the expressions are the same, or **equivalent expressions**, we denote this equality by using $=$.

Suppose x and y give the populations of two different cities where $x > y$. Compare the expressions and tell which of the given pair is greater.

x is greater than y

Example 1

(A) $x + y$ and $2x$
 $x + y < x + x$

(B) $\frac{x}{y}$ and $\frac{y}{x}$
 $\frac{5}{3} > \frac{3}{5}$

Your Turn

Suppose x and y give the populations of two different cities where $x > y$ and $y > 0$. Compare the expressions and tell which of the given pair is greater.

5. $\frac{x}{x+y}$ and $\frac{x+y}{x}$

make up some examples

let $x = 4$ & $y = 3$

$$\frac{4}{4+3} \quad \frac{4+3}{4}$$

$$\frac{4}{7} < \frac{7}{4}$$

6. $2(x+y)$ and $(x+y)^2$

let $x = 4$ & $y = 3$

$$2(4+3) \quad (4+3)^2$$

$$2 \cdot 7 \quad 7^2 = 7 \cdot 7$$

$$14 < 49$$

Homework

Worksheet

&

pg 41; 6-24e

ec:26

Algebra 1

2.1 Modeling with Expressions

Name: _____ Date: _____ Hour: ____

Identify the constants, coefficients, variables, and terms.

1) $3x - 5y + 9$

constants: _____

coefficients: _____

variables: _____

terms: _____

2) $8 - 5r + 4 - 3n$

constants: _____

coefficients: _____

variables: _____

terms: _____

3) $2g - k - 4 - 7h$

constants: _____

coefficients: _____

variables: _____

terms: _____

4) $7w + 4 + 8x + p$

constants: _____

coefficients: _____

variables: _____

terms: _____

5) $9 - 6b + s - 2$

constants: _____

coefficients: _____

variables: _____

terms: _____

6) $-q - 4r - 7$

constants: _____

coefficients: _____

variables: _____

terms: _____

7) $4 - y + 3x - 7p$

constants: _____

coefficients: _____

variables: _____

terms: _____

8) $r - 3s + 1$

constants: _____

coefficients: _____

variables: _____

terms: _____