

Section 1-3

Algebraic Expressions

Are there two integers with a product of 12 and a sum of -3? Explain.

No

1 12
2 6
3 4

Here is your summer work schedule. You walk three dogs and you work part time as a receptionist at a hair salon. You earn \$8 per hour as a receptionist and \$20 per week per dog. Your weekly schedule stays the same. How much will you earn in 10 weeks? Explain.

Dogs: 600
Recep: 1600 \$2200

Mon	Tue	Wed	Thurs	Fri	Sat
Walk dogs: 8 - 9 am Studio: 1 - 5 pm	Studio: 1 - 5 pm	Walk dogs: 8 - 9 am Studio: 1 - 5 pm	Studio: 1 - 5 pm	Walk dogs: 8 - 9 am	Studio: noon - 4 pm

What algebraic expression models the word phrase

a) ten less than a number n

$$n - 10$$

b) three times the sum of x and y

$$(x + y) \cdot 3$$

To model a situation with an algebraic expression, do the following:

- Identify the actions that suggest operations
- Define one or more variables to represent the unknown(s)
- Represent the action using variables and the operations

Model the following situation:

You had \$150, but you are spending \$2 each day.

$$150 - 2n$$

What is the value of the expression for $x = 6$ and $y = -3$:

$$\frac{2(x^2 - y^2)}{3}$$

$$2\left(\frac{36}{3} - \frac{9}{3}\right) = 2\left(\frac{27}{3}\right) = 18$$

Will the value of the expression change if the parenthesis are removed? Explain.

Write an expression to find how many points a team scores in a basketball game.

$$-2ax + 4y + 15$$

Identify: ^{-2, 4} coefficient, ¹⁵ constant, variable, term
 # mult by variab. ax, y

Which of the following are like terms?

$$\underline{\underline{-2x^2y}}$$

$$-2xy^2$$

$$\underline{\underline{3x^2y}}$$

$$\underline{\underline{2yx^2}}$$

Variables match

How do you know?

Simplify:

$$-4j^2 - 7k + 5j + j^2$$

$$-(8a + 3b) + 10(2a - 5b)$$

$$-8a - 3b + 20a - 50b$$

$$12a - 53b$$

Section 1 - 4 Solving Equations

Students will be able to:

- solve equations
- solve problems by writing equations

Define:

Equation:

Solution:

Inverse Operations: $x - 10 = 15$
 $+10$ $+10$ **Properties of Equality**Reflexive: $a = \underline{\hspace{1cm}}$ Symmetric: if $a = b$, then $\underline{\hspace{1cm}}$ Transitive: if $a = b$ and $b = c$, then
 $\underline{\hspace{1cm}}$ Substitution: if $a = b$, then you can
replace $\underline{\hspace{1cm}}$ Say $a = b$. The which of the following property is illustrated?

$a + c = b + c$

$a/c = b/c$

$a - c = b - c$

$a \cdot c = b \cdot c$

Multiplication Prop of Equality

Division Prop of Equality

Subtraction Prop of Equality

Addition Prop of Equality

Solve and justify each step:

$3(2x - 1) - 2(3x + 4) = 11x$

The map shows distances between towns in miles. You and your friend drive together from Newton to Crofton. You drive first, for a total of 40 miles. Then your friend drives 1.5 hours, reaching Crofton. What is your friend's average rate?

An equation does not always have a solution, so there would be no variable that would make it true.

An equation that is true for every value of the variable is an identity.

Never, Sometimes, or Always True?

$$7x + 6 - 4x = 12 + 3x - 8$$

$x = 5$

$$2x + 3(x - 4) = 2(2x - 6) + x$$

Always
 $2x = 2x$ identity or RS
 $0 = 0$
 Never
 $2x = 2x + 1$ \emptyset

What is the formula for **Perimeter** of a rectangle with sides a and b ?

Literal Equations- use at least two different variables

Solve the following for the indicated variable:

$A = 1/2h(b_1 + b_2)$, for b_2

$$2A = \cancel{2}h(b_1 + b_2)$$

$$\frac{2A}{h} = \cancel{h}(b_1 + b_2)$$

$$\frac{2A}{h} - b_1 = b_2$$

Solve for x:

$$c(x+2) - 5 = b(x-3)$$

$$\begin{array}{r} cx + 2c - 5 = bx - 3b \\ -bx - 2c + 5 \quad -bx \quad -2c + 5 \end{array}$$

$$cx - bx = -3b - 2c + 5$$

$$\frac{x(c-b)}{c-b} = \frac{-3b - 2c + 5}{c-b}$$

Hwk:

**pg. 22-24 #12, 15, 18, 19,
42, 44, 48, 56**

pg. 30 - 32

**#20, 26 - 36 evens, 39, 42
46 - 50 evens, 56, 60**

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