Secondary I Notes

2.1: Modeling with Expressions

I. Vocabulary

A. Expression = A mathematical phrase that contains operations, numbers, and/or variables.

B. Terms = The parts of an expression that are being added.

C. Coefficients = The numerical factor of a variable term.

D. Numerical Expression = Contains only numbers.

E. Algebraic Expression = Contains at least one variable.

II. Interpreting Parts of an Expression

A. Example 1

$$8p + 2q + 7r$$

1) Terms = $8p, 2q, 7r$

2) Coefficients = $8, 2, 7$

B. Example 2

$$18 - 2x - 4y$$

1) Rewrite expression to be the sum of terms since subtraction is involved.

$$18 + (-2x) + (-4y)$$

2) Terms = $18, -2x, -4y$

3) Coefficients = $-2, -4$

C. Example 3 (Student Example)

$2x+3y-4z+10$

1) Rewrite Expression as a sum of terms.

$2x+3y+(-4z)+10$

2) Terms = $2x, 3y, -4z, 10$

3) Coefficients = $2, 3, -4$

D. Story Problem Example 1

Tickets to an amusement park are \$60 for adults and \$30 for children. If a is the number of adults and c is the number of children, then the cost for a adults and c children is $60a+30c$.

1) Terms = $60a, 30c$

2) Factors of $60a$ = $60, a$

3) Factors of $30c$ = $30, c$

4) Coefficients = $60, 30$

5) Meaning of terms =

$60a$ is the cost for a adults.

$30c$ is the cost for c children.

E. Story Problem Example 2

The price of a case of juice is \$15.00. Fred has a coupon for 20 cents off each

bottle in the case. The expression to find the final cost of the case of juice is 15-0.2b, wherein b is the number of bottles.

1) Terms = 15, -0.2b

2) Factors of Terms =

15 first term

-0.2 and b second term

3) Coefficients = None for first term

-0.2 for second term.

4) What does the expression mean?

If Fred has a coupon, 20 cents is subtracted from the price of every bottle in the case. If Fred does not have a coupon, then the case costs $15.

III. Interpreting Algebraic Expression in Context

A) Story Example I

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

1) What does 1.49 represent in the term?
- The cost of ~~the~~ one package of crayons.

2) What does 3.49 represent in the term 3.49g
- The cost of one package of markers.

3) What does 1.49p + 3.49g mean?
- The total cost of all packages of crayons p and all packages of markers, g.

IV. Comparing Algebraic Expressions

A. More Vocabulary

1) Equivalent Expressions = Expressions that are the same or equal.

B. ~~2)~~ We can denote inequalities between expressions with (<) ~~greater~~ less than, and ~~less~~ greater than (>) symbols.

C. Examples

~~1) Suppose~~ Suppose x and y give the population of two different cities where $x > y$. Compare the expressions and tell which of the given pair is greater.

1) $x + y$ and $2x$,

Answer = $2x$ is greater

Why? $y < x$ so $y + x < x + x$.

2) $\frac{x}{y}$ and $\frac{y}{x}$

Answer = Since $x > y$, $\frac{x}{y}$ will be greater than 1 and $\frac{y}{x}$ will be less than 1.

So $\frac{x}{y} > \frac{y}{x}$.

3) Student Example

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.

$$\frac{x}{x+y} \quad \text{and} \quad \frac{x+y}{x}$$

Answer = Since $x < x+y$, the first ratio must be less than 1. Since $x < x+y$, the second ratio must be greater than 1.

So $\frac{x+y}{x} > \frac{x}{x+y}$

See Table in your book for words that ~~Homework~~ are associated with operations.

Homework 5

Section 1.3 ~~#~~ Pg. # 2-5, 7, 8, 9-12, 13-17

Section 2.1 Pg. # 1-10, 15-19