1.8 Introduction to Variables, Algebraic Expressions, and Equations

Def. An **algebraic expression** is a combination of operations on variables and numbers.

Ex. $3x + y - 2z$ **Ex.** $7x^2 - 9$

* Evaluating Algebraic Expression
1. Replace each variable in the expression by its value.
2. Perform order of operations.

Ex 1. Evaluate: $y(x-3)$ for $x = 8, y = 4$.

Ex 3. Evaluate: $\dfrac{y+3z}{x}$ for $x = 6, y = 18 = z = 2$.

Ex 2. Evaluate: $25 - z^3 + x$ for $x = 1, z = 2$.

Ex 4. Evaluate: $\dfrac{5(F-32)}{9}$ for $F = 41$.

* Translating Phrases into Variable Expressions

Keywords	Phrase	Translation
The sum of	the sum of x and 8	
The total of	the total of x, y, and z	
Plus	4 plus h	
Increased by	T increased by r	
Exceeds by	exceeds z by 35	
*** Added to	16 added to m	
*** More than	4 more than t	
*** Greater than	20 greater than F	
The difference between	the difference between 23 and p	
Minus	555 minus h	
Decreased by	7 decreased by j	
Reduced by	M reduced by z	
Less	5 less g	
Less than	18 less than v	
Subtracted from	w subtracted from d	
The product of	the product of 4 and y	
Times	3 times B	
Twice	twice q	
Of	one-third of m	
Multiply by	12 multiply by s	
The quotient of	the quotient of R and 19	
The ratio of	the ratio fo c to d	
Divided by	s divided by t	
Split into equal parts	b split into 7 equal parts	
Square	square of a number	
Cube	cube of a number	

Ex 5. Translate into variable expression.

a. The sum of four times a number and seven

b. The product of five and the difference between a number and three

c. Three less than the quotient of a number and four

d. Twelve more than the product of a number and nine

e. Twenty minus twice a number

f. The difference between the square of r and the sum of s and t

g. A number multiplied by the total of six and the cube of the number

h. A number added to the product of five and the square of the number

i. The quotient of twice a number and difference between the number and twenty

j. The product of three and the sum of seven and twice an number

k. The sum of three-forth of a number and one-fifth of the same number

l. The total of four times a number and twice the difference between the number and eight

Ex 6. Find the sum of 53, 78, and 92.

Ex 7. Find the quotient of 123 and 4.

Ex 8. 89 subtracted from 425.