1.5 Algebraic Expressions: Translating, Evaluating, and Simplifying

Definition A _____ is a number, a variable, or the product or quotient of numbers and variables

_____ are seperated by + signs.

Any time there is a − sign, it can be written with a plus sign as follows

$$3x^2 + 2x - 7 = 3x^2 + 2x + (-7)$$

so the terms of this expression are $3x^2$, $2x$, and -7.

Ex 1) Translate each algebraic expression to words.

Algebraic Expression	Translation
a. $\frac{1}{5}x$	
b. $5 - x$	
c. $s \div (-4)$	
d. $n + (-10)$	
e. $\frac{5}{8}m$	
f. $6x - 7$	
g. $10(a + b)$	
h. $\frac{3}{p - q}$	

Ex 2) Translate each phrase to an algebraic expression.

Phrase	Translation
a. $\frac{1}{5}$ of a number	
b. The sum of a number and negative 1	
c. The difference between x and negative 2	
d. The ratio of 4 and n	
e. The product of negative 3 and d	
f. 12 less than the product of 3 and y	
g. The quantity of a plus b divided by the quantity a minus b	

To Evaluate an Algebraic Expression
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Ex 3) Find the value of each expression for $a = 4$, $b = -1$, $c = -2$, and $d = 3$.

a. $5a - 1$

b. $-c^4$

c. $(-c)^4$

d. $3b - 2d$

Ex 4) Find the value of each expression when $x = -2$, $y = -1$, and $z = 3$.

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a. $\dfrac{x+z}{x-y}$

b. $\dfrac{x-3z}{y}$

c. $-4z^2 - 4(y-z)$

d. $5y^2 + z^3$

Definition _____ are terms that have the *same variables* with the *same exponents.*

Ex 5) Combine like terms.

a. $-7y - y$

b. $a - 4a + 8b$

Ex 6) Simplify, if possible.

a. $y^2 - 6y$

b. $2n^2 - 5n^3 + 7n^3$

c. $9xy^2 - xy^2$

d. $5\left(y - \frac{2}{5}\right) + 8$

e. $-(4a - 9b)$

f. $3y+7-(2y-5)$

g. $5(5y+8)-3(7y+10)$

h. $13-2[-15y+4(3y-1)]$