3.1 ALGEBRAIC EXPRESSIONS

ESSENTIAL QUESTION: How can you write and evaluate an expression that represents a real-life situation?

$5 + 7 \rightarrow$ expression $\qquad 5x + 7 \rightarrow$ Algebraic expression.

Algebraic Expression-> An expression that may contain numbers, operations and one or more symbols (letters).

Parts of an algebraic expression separated by addition and subtraction signs are called terms.

$2x^2 + 5 - x$ → $2x^2$, 5, and x are called terms.

(1) Variable -> A symbol that represents one or more numbers.

$5p + 4$

(3) Coefficient -> Number in front of a variable.

(2) Constant -> A term without a variable.

EXAMPLE 1

Identify the terms, coefficients, and constants in each expression.

1) $5x + 3$

Terms → $5x, 3$

Coefficients → 5

Constant → 3

2) $2r^2 + y + 3$

Terms → $2r^2, y, 3$

Coefficients → 2, 1

Constant → 3

ON YOUR OWN

Identify the terms, coefficients, and constants in each expression.

1) $12 + 10c$

Terms → 12, 10c

Coefficients → 10

Constant → 12

2) $15 + 3w + \frac{1}{2}$

Terms → $15, 3w, \frac{1}{2}$

Coefficients → 3

Constant → 3

3) $z^2 + 9z$

Terms → $z^2, 9z$

Coefficients → 1, 9

Constant → none

EXAMPLE 5

Evaluate the expression.

1) $3x - 14$ *when* $x = 5$

$3 \cdot 5 - 14$

$15 - 14$

1

2) $z^2 + 8.5$ *when* $z = 2$

$2^2 + 8.5$

$4 + 8.5$

12.5

ON YOUR OWN

Evaluate the expression.

1) $5y + 1$ *when* $y = 6$

$5(6) + 1$

$30 + 1$

31

2) $30 - 24 \div y$ *when* $y = 6$

$30 - 24 \div 6$

$30 - 4$

26

3) $y^2 - 7$ *when* $y = 6$

$6^2 - 7$

$36 - 7$

29

4) $1.5 + y^2$ *when* $y = 6$

$1.5 + 6^2$

$1.5 + 36$

37.5

EXAMPLE 6

You are saving money to buy a skateboard. You begin with $45 and you save $3 each week. The expression 45 + 3w gives the amount of money you save after w weeks.

a. How much will you have after 4 weeks, 10 weeks, and 20 weeks?

# of weeks	Expression $45+3w$	Amount Saved
4	$45+3(4)$	$45+12 = \$57$
10	$45+3(10)$	$45+30 = \$75$
20	$45+3(20)$	$45+60 = \$105$

b. After 20 weeks, can you buy the skateboard? Explain

After 20 weeks you will only have $105. That is not enough for the $125 skateboard