1.2 (Page 19)   Variables & Expressions

In algebra, a placeholder is called a VARIABLE because the value can change or vary.

Variables are usually lower case letters.

Combinations of variables, numbers, and at least one operation (i.e. addition, subtraction, multiplication, and division) are called ALGEBRAIC EXPRESSIONS.

Expressions can be evaluated by replacing variables with numbers and then finding the value of the numerical expression.
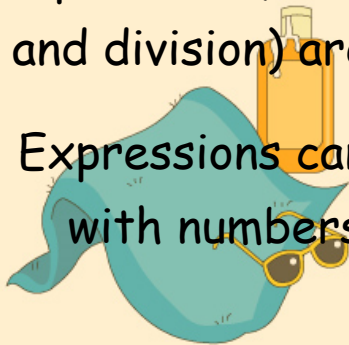
1.2 (Page 19)   Variables & Expressions

When you replace a variable with a number, you are using an important property of numbers.

SUBSTITUTION PROPERTY OF EQUALITY

For all numbers a & b, if a = b, then a may be replaced with b.
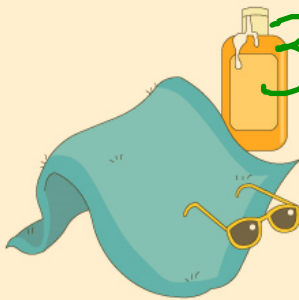
1.2 (Page 19)   Variables & Expressions

Example: Evaluate the expression.

$r + s - 15$ if $r = 21$ and $s = 18$

$$21 + 18 - 15$$

$$39 - 15$$

$$24$$

1.2 (Page 19)   Variables & Expressions

Just as with numerical expressions, mathematicians agree on special notation for multiplication and division with variables.

$2a$ ====> $2 \times a$

mn ====> $m \times n$

$6bc$ ====> $6 \times b \times c$

$\dfrac{k}{5}$ ====> $k \div 5$

1.2 (Page 19)   Variables & Expressions

Example: Evaluate the expression.

$2a + 7b$ if $a = 5$ and $b = 3$

$$2(5) + 7(3)$$

$$10 + 7(3)$$

$$10 + 21$$

$$31$$

1.2 (Page 19)   Variables & Expressions

Example: Evaluate the expression.

$\dfrac{xy}{4}$ if $x = 6$ and $y = 8$

$$\frac{(6)(8)}{4} = \frac{48}{4} = 12$$

1.2 (Page 19)   Variables & Expressions

Example: Evaluate the expression.

$$\frac{6(a + b)}{3c}$$ if a = 4, b = 2 and c = 3

$$\frac{6(4 + 2)}{3(3)} = \frac{6(6)}{9} = \frac{36}{9} = 4$$

1.2 (Page 19)   Variables & Expressions

Example: Evaluate the expression.

2g + (4h – k) + 7 if g = 5, h = 3 and k = 8

$$2(5) + (4 \cdot 3 - 8) + 7$$

$$2(5) + (12 - 8) + 7$$

$$2(5) + 4 + 7$$

$$10 + 4 + 7 = 21$$