

Topic

Sets of Numbers

Variable Expressions

The set of natural numbers is $\{1, 2, 3, \dots\}$

The members of a set are called its elements.

Ways to write a set:

$\{x \mid x \text{ is a natural number}\}$

$\{x \mid x \geq 1\}$

Roster Form - Members of a set are listed such as $\{1, 2, 3, \dots\}$ or $\{3, 5\}$

→ list

Set Builder Notation - Members of a set are described but not listed $\{x \mid x \text{ is a natural number less than } 5\}$

→ "such that" ← read this as

The set of all x such that x is a natural number less than 5.

Write the following in roster form: *list*

1) $\{x \mid x \text{ is a whole number between } 0 \text{ and } 4\}$

$\{1, 2, 3\}$

2) $\{x \mid x \text{ is a natural number greater than } 80\}$

$\{81, 82, 83, \dots\}$

3) $\{x \mid x \text{ is an integer between } -4 \text{ and } 2\}$

$\{-3, -2, -1, 0, 1\}$

$\{\}$ \emptyset

4) $\{x \mid x \text{ is a natural number less than } 1\}$

$\{\text{None}\}$ *empty set*

The answer to number four is called an **empty set** or **null set**.

Symbolized by $\{ \}$ or \emptyset

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More Vocabulary:

Variables: letters/symbols that represent numbers/values

Algebraic Expression: formed one or more terms (numbers and variables) connected by one or more operations (addition, subtraction, multiplication, division, raising to powers, and/or taking roots).

Example: $2x + 3$, $\frac{x+5}{6} - \frac{z^2}{y^2}$ and $\sqrt{y} - 1.6$

$\frac{x+5}{6} - \frac{z^2}{y^2}$

How many terms?

An expression has no = sign

*How many ops?
6*

Translate each phrases to an algebraic expression. Use the variable x to represent each unknown number.

Four times a number.

$$4x$$

Three less than twice a number.

$$2x - 3$$

The quotient of a number and -8

$$\frac{x}{-8}$$

The sum of a 9 and three times a number

$$9 + 3x$$

12 divided by a number

$$\frac{12}{x}$$

Six times the sum of a number and ten

$$6(10 + x)$$

Parenthesis

the quantity
the sum of

the quantity of 6 divided by a
number plus 2

$$\left(\frac{6}{x}\right) + 2$$

Turn around

5 less than 10
 $10 - 5 = 5$

4 less than x
 ~~$4x$~~ $x - 4$

Simplify

Evaluate: $4x + 2y$ when $x = -2$ and $y = 7$

$$4(-2) + 2(7)$$

$$-8 + 14$$

$$6$$

Evaluate: $-m + n$ when $m = 3.4$ and $n = 2$

$$-3.4 + 2$$

$$-1.4$$

Evaluate: $4a - b$ when $a = \frac{1}{2}$ and $b = 3$

$$\frac{4}{2} - 3$$

$$2 - 3$$

$$-1$$

* Write the numbers 1-28 down the back of your Weekly Practice/Homework.

