

Lesson 5

Place Value Through Hundred Trillions
Reading and Writing Whole Numbers

Place value

In our number system the value of a digit depends upon its position within a number. The value of each position is its **place value**. The chart below shows place values from the ones place to the hundred-trillions place.

Whole Number Place Values

hundred trillions	ten trillions	trillions	hundred billions	ten billions	billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones	decimal point
—	—	—	,	—	—	—	,	—	—	—	,	—	—	—	.

Example

- a. Which digit is in the trillions place in the number 32,567,890,000,000?**
- b. In 12,457,697,380,000, what is the place value of the digit 4?**

Solution

- a. The digit in the trillions place is **2**.
- b. The place value of the digit 4 is **hundred billions**.

Example 2

Example 2

Rewrite the expression below by replacing the circle with the correct comparison symbol. Then use words to write the comparison.

$$-5 \bigcirc 3$$

Solution

Since -5 is less than 3 , we write

$$-5 < 3$$

Negative five is less than three.

Expanded Notation

We write a number in **expanded notation** by writing each nonzero digit times its place value. For example, we write 5280 in expanded notation this way:

$$\begin{aligned} &(5 \times 1000) + (2 \times 100) + (8 \times 10) \\ &= 5000 + 200 + 80 \\ &= 5280 \end{aligned}$$

Example

Example 2

Write 25,000 in expanded notation.

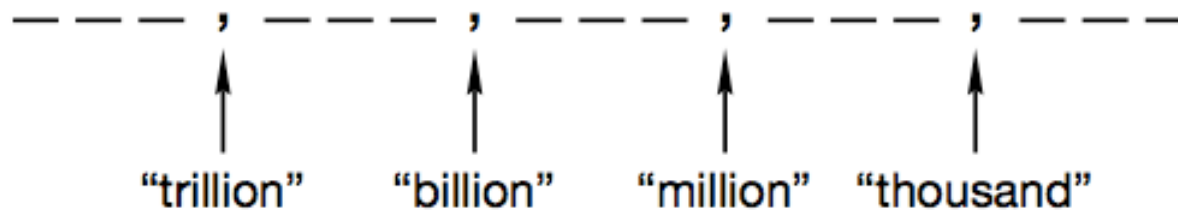
Solution

$$(2 \times 10,000) + (5 \times 1000)$$

Justify Why do we multiply 10,000 by 2 and 1000 by 5? The 2 is in the ten thousands place and the 5 is in the thousands place.

Reading Big Numbers

Whole numbers with more than three digits may be written with commas to make the numbers easier to read. Commas help us read large numbers by separating the trillions, billions, millions, and thousands places. We need only to read the three-digit number in front of each comma and then say either “trillion,” “billion,” “million,” or “thousand” when we reach the comma.



Practice

12,000,000

120,345,000

21,000,000,000

31,000,120,000,001

21000000000000

Review

- The value of a number is determined by its **place value**.
- In **expanded notation** we take a number times its place value
 - ex: $20,000 = (2 \times 10,000)$
- We read big numbers as by their group
 - ex: 100,120,000 is read “one-hundred million, one-hundred twenty thousand”
- “and” represents a decimal point (.)

Homework

- Practice Set and Written Practice
- Due Friday