

Whole Numbers

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SECTION 1.3

Rounding Numbers and Estimating Answers

Objectives

- A** Round whole numbers.
- B** Estimate the answer to a problem.



A Rounding

Rounding

The steps used in rounding numbers are given below.

Strategy Rounding Whole Numbers

To summarize, we list the following steps:

- Step 1** Locate the digit just to the right of the place to which you want to round.
- Step 2** If that digit is less than 5, replace it and all digits to its right with zeros.
- Step 3** If that digit is 5 or more, replace it and all digits to its right with zeros, and add 1 to the digit to its left.

You can see from these rules that in order to round a number you must be told what column (or place value) to round to.

Example 1

Round 5,382 to the nearest hundred.

Solution:

There is a 3 in the hundreds column.

We look at the digit just to its right, which is 8.

Because 8 is greater than 5, we add 1 to the 3, and we replace the 8 and 2 with zeros.

5,382 is 5,4**00** to the nearest hundred.

8 is greater than 5.

Add 1 to get 4.

Put zeros here.

Rounding

Table 1 gives more examples of rounding.

TABLE 1			
Original Number	Rounded to the Nearest		
	Ten	Hundred	Thousand
6,914	6,910	6,900	7,000
8,485	8,490	8,500	8,000
5,555	5,560	5,600	6,000
1,234	1,230	1,200	1,000

Rule Rounding Numbers

Do all arithmetic first and then round the result. That is, the last step is to round the answer; we don't round the numbers first and then do the arithmetic.



B Estimating

Estimating

When we *estimate* the answer to a problem, we simplify the problem so that an approximate answer can be found quickly.

There are a number of ways of doing this. One common method is to use rounded numbers to simplify the arithmetic necessary to arrive at an approximate answer.

In other words, we will round the numbers prior to calculating our answer.

Example 6

Estimate the answer to the following problem by rounding each number to the nearest thousand.

$$\begin{array}{r} 4,872 \\ 1,691 \\ 777 \\ + 6,124 \\ \hline \end{array}$$

Example 6 – *Solution*

We round each of the four numbers in the sum to the nearest thousand.

Then we add the rounded numbers.

4,872	rounds to	5,000
1,691	rounds to	2,000
777	rounds to	1,000
<u>+ 6,124</u>	rounds to	<u>+ 6,000</u>
		14,000

We estimate the answer to this problem to be approximately 14,000. The actual answer, found by adding the original unrounded numbers, is 13,464.