

10.2.1.2: Proper and Improper Fractions

Learning Objectives

- Learn the rules for rounding.
- Round whole numbers to specific place values, including tens, hundreds, and thousands.

Introduction

In some situations, you don't need an exact answer. In these cases, **rounding** the number to a specific **place value** is possible. For example, if you travelled 973 miles, you might want to round the distance to 1,000 miles, which is easier to think about. Rounding also comes in handy to see if a calculation is reasonable.

Rounding Whole Numbers

These are the rules for rounding **whole numbers**:

First, identify the digit with the place value to which you are rounding. You might circle or highlight the digit so you can focus on it better.

Then, determine the possible numbers that you would obtain by rounding. These possible numbers are close to the number that you're rounding to, but have zeros in the digits to the right.

If you are rounding 186 to the nearest ten, then 180 and 190 are the two possible numbers to round to, as 186 is between 180 and 190. But how do you know whether to round to 180 or 190?

Usually, round a number to the number that is closest to the original number.

When a number is halfway between the two possible numbers, round up to the greater number.

Since 186 is between 180 and 190, and 186 is closer to 190, you round up to 190.

You can use a number line to help you round numbers.

✓ Example

A camera is dropped out of a boat, and sinks to the bottom of a pond that is 37 feet deep. Round 37 to the nearest ten.

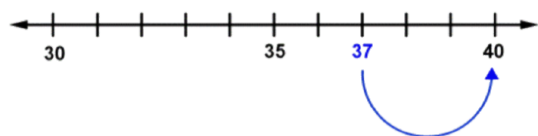
Solution

37

The digit you're rounding to is the tens digit, 3.

30...37...40

37 is between 30 and 40.



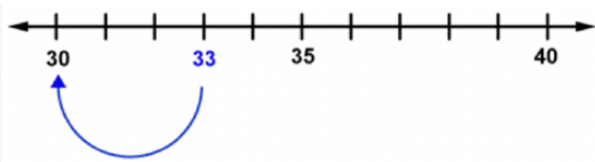
37 is only 3 away from 40, but it's 7 away from 30. So, 37 is closer to 40.

To the nearest ten, 37 rounds to 40.

✓ Example

Round 33 to the nearest ten.

Solution



33 rounds to 30 because 33 is closer to 30.

To the nearest ten, 33 rounds to 30.

You can determine where to round without using a number line by looking at the digit to the right of the one you're rounding to. If that digit is less than 5, round down. If it's 5 or greater, round up. In the example above, you can see without a number line that 33 is rounded to 30 because the ones digit, 3, is less than 5.

✓ Example

Round 77 to the nearest ten.

Solution

77 rounds to 80 because the ones digit, 7, is 5 or greater.

77 rounded to the nearest ten is 80.

✓ Example

There are 576 jellybeans in a jar. Round this number to the nearest ten.

Solution

576 rounds to 580 because the ones digit, 6, is 5 or greater.

576 rounded to the nearest ten is 580.

In the previous examples, you rounded to the tens place. The rounded numbers had a 0 in the ones place. If you round to the nearest hundred, the rounded number will have zeros in the tens and ones places. The rounded number will resemble 100, 500, or 200.

✓ Example

A runner ran 1,539 meters, but describes the distance he ran with a rounded number. Round 1,539 to the nearest hundred.

Solution

1,539 rounds to 1,500 because the next digit is less than 5.

1,539 rounded to the nearest hundred is 1,500.

If you round to the nearest thousand, the rounded number will have zeros in the hundreds, tens, and ones places. The rounded number will resemble 1,000, 2,000, or 14,000.

✓ Example

A plane's altitude increased by 2,721 feet. Round this number to the nearest thousand.

Solution

2,721 rounds to 3,000 because the next digit, 7, is 5 or greater.

2,721 rounded to the nearest thousand is 3,000.

Now that you know how to round to the nearest ten, hundred, and thousand, try rounding to the nearest ten thousand.

✓ Example

Round 326,749 to the nearest ten thousand.

Solution

326,749 rounds to 330,000 because the next digit, 6, is 5 or greater.

326,749 rounded to the nearest ten thousand is 330,000.

? Exercise

A record number of 23,386 people voted in a city election. Round this number to the nearest hundred.

- A. 23,300
- B. 23,400
- C. 23,000
- D. 23,390

Answer

- A. Incorrect. The two possible numbers are 23,300 and 23,400, but 23,386 is closer to 23,400. The tens digit, 8, is 5 or greater, so you should round up. The correct answer is 23,400.
- B. Correct. The two possible numbers are 23,300 and 23,400, and 23,386 is closer to 23,400. The tens digit, 8, is 5 or greater, so you should round up.
- C. Incorrect. This number is rounded to the nearest thousand, not the nearest hundred. The correct answer is 23,400.
- D. Incorrect. This number is rounded to the nearest ten, not the nearest hundred. The correct answer is 23,400.

Summary

In situations when you don't need an exact answer, you can round numbers. When you round numbers, you are always rounding to a particular place value, such as the nearest thousand or the nearest ten. Whether you round up or round down usually depends on which number is closest to your original number. When a number is halfway between the two possible numbers, round up to the larger number.

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