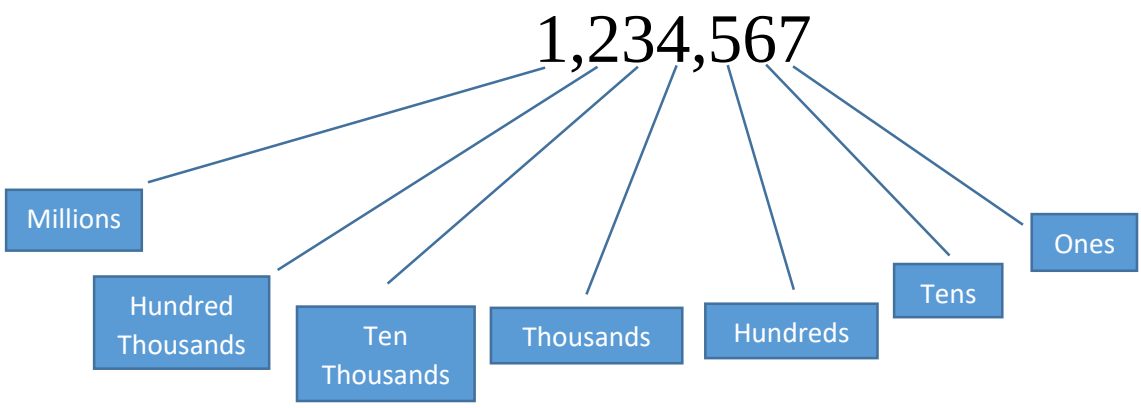
Rounding and Estimation

Objective 1: Rounding Whole Numbers



1. Locate and draw a line under the place where the number is to be rounded.
2. Look at the number to the right of the underlined number.
    a. If it is 5 or more, then **increase** the underlined number by 1.
    b. If it is 4 or less, then **do not change** the underlined number.
3. All of the digits to the right of the underlined number change to zeros.

Example: Round to the nearest hundred: 27,356

Example: Round to the nearest million: 3,750,976

Example: Round to the nearest ten: 2,473

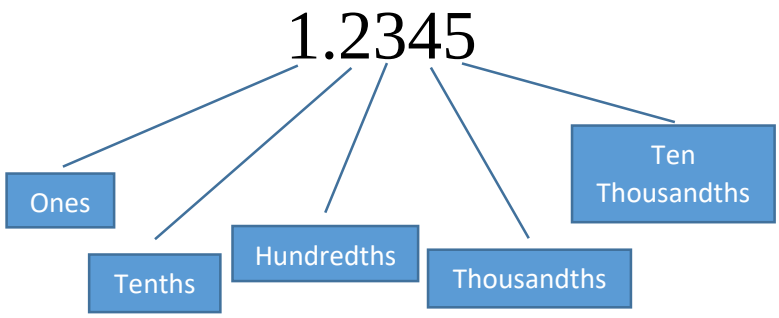
Questions

1. Round to the nearest ten: 87

2. Round to the nearest thousand: 8499

3. Round to the nearest hundred thousand: 3,352,149

Objective 2: Rounding Decimal Numbers



1. Follow the exact same steps for rounding integers.
2. In addition:
   a. If rounding to the nearest whole number, drop all digits beyond the decimal
   b. If rounding to a position on the right of the decimal, drop all digits to the right of the place that you are rounding to

Example: Round to the nearest thousandth: 4.2825

Example: Round to the nearest tenth: 12.735

Example: Round to the nearest whole number: 196.82

Example: Round to the nearest hundredth: 53.097

Questions

1. Round to the nearest whole number: 430.72

2. Round to the nearest hundredth: 0.9847

3. Round to the nearest thousandth: 32.5376

Objective 3: Rounding Fractions and Mixed Numbers

1. When rounding a mixed number to the nearest whole number, look at the fractional part of the mixed number.
    a. If the fractional part is greater than or equal to ½, then round the whole number up by 1.
    b. If the fractional part is less than ½, then leave the whole number alone.
    c. Leave off the fractional part after rounding.
2. If you wish to round an improper fraction, first convert it to a mixed number and follow the steps above.

Note: A fraction is less than ½ if the numerator is less than ½ of the denominator.

Example: Round to the nearest whole number: $2\frac{1}{4}$

Example: Round to the nearest whole number: $9\frac{7}{15}$

Example: Round to the nearest whole number: $\frac{25}{7}$

Questions

1. Round to the nearest whole number: $7\frac{3}{5}$

2. Round to the nearest whole number: $42\frac{6}{13}$

3. Round to the nearest whole number: $\frac{41}{4}$

Objective 4: Estimation

Estimation is a quick way to determine if the result of a calculation seems reasonable. To estimate the result of a calculation, round everything **before** doing the calculations. This will make it easier to compute.

Example: A parking lot has a total of four sides of different lengths. The sides are 51 ft, 78 ft, 49 ft, and 103 ft in length. Estimate the perimeter, or total length around, by first rounding all the lengths to the nearest ten feet.

Example: Estimate the quotient by rounding to the nearest whole number first: $\left(59\frac{5}{8}\right)\div\left(5\frac{1}{3}\right)$

Example: After you earn a college degree, you land a job that pays $75,489.57 taxable income in your first year. To determine the amount of tax that is owed to the federal government, you need to multiply your income by the rate of 22% = 0.22 for this tax bracket. Round your income to the nearest thousand and the tax rate to the nearest tenth as you estimate the total tax you owe.

Questions

1. Estimate the quotient by rounding to the nearest whole number first: $\left(360\frac{3}{8}\right)\div\left(5\frac{3}{4}\right)$

2. After you earn a college degree, you land a job that pays $85,289.56 taxable income in your first year. To determine the amount of tax that is owed to the federal government, you need to multiply your income by the rate of 22% = 0.22 for this tax bracket. Round your income to the nearest ten thousand and the tax rate to the nearest tenth as you estimate the total tax you owe.

3. Estimate the following sum by rounding each number to the nearest whole number first before adding.
   42.78 + 9.5 + 11.13 + 15.623