

Basic Arithmetic
Skill-Builder # W – 13
Estimating

In practical applications it is sometimes handy to be able to come up with an estimate of what the sum, product, difference, or quotient will be. Estimation also gives a good way of checking if our answer to a computation is reasonable. In order to come up with an estimate of the desired result one first rounds each whole number involved in the operation(s) to the desired place value before actually performing the operation(s).

Examples

1. Estimate the sum $3,487 + 12,509$ by rounding each addend to the nearest thousand.

Solution:

$$\begin{array}{r} \underline{3} \, 4 \, 87 \approx 3000 \text{ and } \underline{12} \, 5 \, 09 \approx 13000 \\ <5 \qquad \qquad \qquad =5 \end{array}$$

Thus, the estimated sum is $3,000 + 13,000 = 16,000$.

2. Estimate the difference $104,647 - 92,743$ by first rounding each number to the nearest ten thousand.

Solution:

$$\begin{array}{r} \underline{10} \, 4,647 \approx 100,000 \text{ and } \underline{9} \, 2,743 \approx 90,000 \\ <5 \qquad \qquad \qquad <5 \end{array}$$

Thus, the estimated difference is $100,000 - 90,000 = 10,000$.

3. Estimate the product 785×929 by rounding each factor to the nearest hundred.

Solution:

$$\begin{array}{r} \underline{7} \, 8 \, 5 \approx 800 \text{ and } \underline{9} \, 2 \, 9 \approx 900 \\ >5 \qquad \qquad \qquad <5 \end{array}$$

Thus, the estimated product is $800 \times 900 = 720,000$.

4. Estimate the quotient $4056 \div 38$ by rounding the dividend to the nearest thousand and the divisor to the nearest ten.

Solution:

$$\begin{array}{r} \underline{4} \, 0 \, 56 \approx 4000 \text{ and } \underline{3} \, 8 \approx 40 \\ <5 \qquad \qquad \qquad >5 \end{array}$$

Thus, the estimated quotient is $4000 \div 40 = 100$.

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Estimate the following according to the rounding instructions.

1. $11,245 + 24,508 + 9,789$; round each addend to the nearest thousand

2. $34,043 - 21,012$; round both minuend and subtrahend to the nearest ten thousand

3. $460 \times 627 \times 252$; round each factor to the nearest hundred

4. $6,309,891 \div 8,918$; round the dividend to the nearest hundred thousand and the divisor to the nearest thousand

5. $(28)^3$; round the base to the nearest ten

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Answers

1. 46,000
2. 10,000
3. 90,000,000
4. 700
5. 27,000

Prepared by: Teresa V. Sutcliffe, Spring 2012