The Calculator and Estimating

A calculator has buttons for each of the numbers from 0 to 9. The button with the plus (“ + ”) sign is used for addition. Similarly, the minus (“ − ”) button for subtraction, the times (“ × ”) button for multiplication, and divide (“ ÷ ”) or (“ / ”) button for division. To get an answer, push “ = ”.
For example, to calculate 34 × 2,492, press [3] [4] [x] [2] [4] [9] [2] [=]
and the calculator should show you 84728.

In this lesson, use your calculator for *every exercise*. Otherwise, use a calculator only if you see the little calculator image next to the exercise.

1. First estimate the answer by using rounded numbers. Then calculate the exact answer with a calculator. Lastly, find the error of estimation with a calculator.

The error of estimation is the *difference* between the exact answer and the estimated answer.

a. 54,395 + 89,302 (round to thousands)

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

b. 9,807,520 − 1,532,392 (round to millions)

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

c. 1,224,845 (to millions) ÷ 995 (to thousands)

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

d. 2,873 × 3,204 (round to thousands)

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

e. 2,793 × 423

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

f. 132 × 49 × 8,231

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

2. Estimate first, using mental math. Round the numbers so that they become easy to multiply in your head. Then find the exact answer and the error of your estimation using a calculator.

a. Dad bought 16 metal pipes for $46.50 each. What was the total bill?

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

b. Kristen bought six boxes of crayons for $1.55 a box and one set of pencils for $9.80. What was the total bill?

My estimation: _____

_____

Exact answer: _____

Error of estimation: _____

3. Calculate with a calculator. *Hint:* When you have the answer of your previous calculation on the calculator screen, simply press [x] [5] to get the next answer.

a.	**b.**	**c.**
$5^1 = 5$	5^5 = _____	5^9 = _____
$5^2 = 5 \times 5 = 25$	5^6 = _____	5^{10} = _____
$5^3 = 5 \times 5 \times 5 = 125$	5^7 = _____	5^{11} = _____
$5^4 = 5 \times 5 \times 5 \times 5$ = _____	5^8 = _____	5^{12} = _____

4. Look at the powers of 5 you calculated in the previous exercise. Which power of 5 was the first one that was more than one million?

5. Multiply 8 by itself repeatedly. *Note:* If the answers to the last problems do not fit into your calculator screen, just leave them empty.

a.	**b.**	**c.**
$8^1 = 8$	8^5 = _____	8^9 = _____
$8^2 = 8 \times 8 = 64$	8^6 = _____	8^{10} = _____
$8^3 = 8 \times 8 \times 8$ = _____	8^7 = _____	8^{11} = _____
8^4 = _____	8^8 = _____	8^{12} = _____

6. Look at the powers of 8 you calculated in the previous exercise.

a. Which power of 8 was the first one that was more than one million?

b. Which power of 8 was the first one that was more than one billion?