

Equations with Two Operations

The Elderberry Taxi Service charges \$2 for a trip into town and \$1 for the return trip. Isabel took two round-trips into town this past week. How much did she pay in all?

How many operations do you need to solve the problem?

Your plan for this problem will involve more than one operation. Perhaps you would think something like this:

PLAN: First I should add the costs of the trips to and from town. Then I should multiply the total cost by the number of round-trips.

Using what you learned about set-ups, you could write

$$\begin{array}{c} (\$2 + \$1) \times 2 = \$6 \\ \uparrow \quad \uparrow \\ \text{costs} \quad \text{trips} \end{array}$$

This can also be written as $2(\$2 + \$1) = 6$.

As you learned, you should do the operation **inside the parentheses first**. In this case, the parentheses tell you to add first, then multiply.

Let's look at another problem with more than one operation.

Ramón started the day with \$35.70 in his wallet. He spent \$4.50 on breakfast and bus fare, then divided the remaining money equally between his wife and his daughter. How much money did Ramón's wife receive?

PLAN: I should subtract the money Ramón spent from the amount he started with. Then I should divide the remaining amount by the number of people he gave it to.

$$\begin{array}{c} (\$35.70 - \$4.50) \div 2 = \$15.60 \\ \uparrow \quad \uparrow \quad \uparrow \\ \text{money he} \quad \text{amount} \quad \text{wife \&} \\ \text{started with} \quad \text{spent} \quad \text{daughter} \end{array}$$

Again, see that the parentheses in the equation tell you which operation should be performed first. Look at what would happen if you did the dividing *before* the adding.

$$\begin{aligned} \text{RIGHT: } & (\$35.70 - \$4.50) \div 2 \\ & = \$31.20 \div 2 \\ & = \mathbf{\$15.60} \end{aligned}$$

~~$$\begin{aligned} \text{WRONG: } & \$35.70 - (\$4.50 \div 2) \\ & = \$35.70 - \$2.25 \\ & = \mathbf{\$33.45} \end{aligned}$$~~

When you read a word problem, decide whether it will take one operation or more than one operation to solve. Then write an equation that shows all of the operations.

Remember This
Order of Operations:

1. Solve within parentheses first.
2. Do multiplication and division next, from left to right.
3. Do addition and subtraction last, from left to right.

Choose the correct equation that represents each problem below.

- WN** 1. Mary has taken 18 sick days in 3 years. On average, how many sick days has she taken each month?

a. $18 \div (3 \div 12) = 72$

b. $(18 \div 3) \div 12 = \frac{1}{2}$

- WN** 2. An art teacher divided a box of 36 crayons among 4 students. He then added 3 crayons to each student's pile. How many crayons did each student get?

a. $(36 \div 4) + 3 = 12$

b. $36 \div (4 + 3) = 5.14$

- D** 3. Inés's electric bill came to \$64.89 last month. A total of \$14.01 of that amount was for services and tax; the remaining amount was for the kilowatt-hours of energy she consumed. If the electric company charges \$0.06 per kilowatt hour, how many kilowatt hours did Inés consume?

a. $\$64.89 - (\$14.01 - \$0.06) = 50.94$

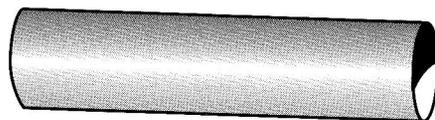
b. $(\$64.89 - \$14.01) \div \$0.06 = 848$

- D** 4. A building company is deciding whether or not to purchase two adjacent lots; one lot measures 1.75 acres, and the other measures 2.8 acres. The owner will sell the land for \$1,244 per acre. How much would both lots cost?

a. $(1.75 + 2.8) \times \$1,244 = \$5,660.20$

b. $1.75 + (2.8 \times \$1,244) = \$3,484.95$

- M** 5. A factory worker is responsible for cutting plastic tubes like the one shown into 2-inch lengths. If the worker cuts 20 tubes in 1 hour, how many 2-inch lengths will he have at the end of an hour?



2 ft

- a. $(24 \times 20) \div 2 = 240$ b. $24 \div (20 \div 2) = 2.4$



Write an equation for each of the following problems. Then solve the problems.

- WN** 6. Lisa made 3 dozen cupcakes to take to her office on Valentine's Day. She left 14 cupcakes on the second floor, then divided the remaining cupcakes among the 22 people who work on the fifth floor. How many cupcakes did each worker on the fifth floor receive?

EQUATION:

- WN** 7. Computer World's newest printer can print an average of 400 words per minute. How long would it take for the printer to print Ms. Savage's weekly report if that report is 15 pages long with 200 words per page?

EQUATION:

- D** 8. Mrs. Teel bought two swordfish at the local market; one weighed 3.5 pounds, and the other weighed 2.0 pounds. If the cost of the fish totaled \$45.65 before tax, how much did they cost per pound?

EQUATION:

- F** 9. Last week Howard worked $8\frac{1}{2}$ hours on Monday, $4\frac{1}{2}$ hours on Tuesday, and $6\frac{1}{2}$ hours on Friday. If Howard earns \$7.10 per hour, how much did he earn that week?

EQUATION: