

Routine Writing Equations Practice #1

The purpose of this exercise is to **write equations**, which you can then solve.

There is **no** point using "guess and check" or working backwards using only numerical techniques, even if they are easy to do that way. That builds no skills for solving harder ones.

Write equations for each situation, and then solve the equation to find the answer.

(Note: because the process is what is important, the answer is already given for the first three questions, to help focus on the process.)

1. Bill buys three ice-creams and has \$1.75 change from a \$10 note. How much are the ice-creams each? (answer = \$2.75)
2. Sam drives 536 km to get to the beach for his holidays. He breaks the drive into two parts. The first is 42 km longer than the second. How long is the first? (answer = 289 km)
3. Find the dimensions (that is, lengths) of the rectangle that is twice as wide as it is high and which has a perimeter of 450 cm. (answer = 75 cm by 150 cm)
4. A company's profits increase by 10% two years in a row. It ends up being \$235,000. What was it originally?
5. An isosceles triangle has a large angle that is six times the size of the two smaller angles. What is the size of the large angle?
6. Brenda buys 2 large bottles of drink and 3 small bottles of drink, and it costs \$7.80. If a large bottle costs \$0.65 more than a small bottle, how much is a small bottle?

Answers: Routine Writing Equations Practice #1

The equations we are looking for are shown in bold. Other forms of the equation are acceptable, provided they give the right values, and obviously the letters chosen for the unknown(s) do not matter.

1. Let an ice-cream cost = x . We are told: **$3x + 1.75 = 10$**
 $3x = 10 - 1.75$ $x = 8.25 \div 3$ **An ice-cream costs \$2.75**

Note: writing $10 - 1.75 \div 3 = 2.75$ is **not** solving using an equation. In the context of an algebra test it is effectively worthless. (It is also wrong: $10 - 1.75 \div 3 = 9.41$)

2. $a + b = 536$ But $b = a - 42$ So **$a + (a - 42) = 536$**
 $2a - 42 = 536$ $2a = 536 + 42$ $a = 578 \div 2 = 289$

The first is 289 km long

3. Short side, x , is doubled to give long side = $2x$.
 $x + 2x + x + 2x = 450$ $6x = 450$ $x = 450 \div 6$

The long side is twice x **The rectangle is 75 cm by 150 cm**

4. Call the start profit x . We are told that $1.1 \times 1.1 \times x = 235000$
 $1.21x = 235000$ (although you can stay with the form $1.1 \times 1.1 \times x = 235000$)
 $x = 235000 \div 1.21$ $x = 194215$ **The profit was \$194,215.**

Note that taking 10% off \$235,000 twice gives \$190,350, which is totally wrong. This is an example of a question that cannot be solved by numerical techniques only.

5. Call the small angles x . There are 180° in a triangle
So we know that $x + x + 6x = 180^\circ$ **$8x = 180$**
 $x = 180 \div 8 = 22.5$ Big angle is $6x$ **The large angle is 135°**

6. 2 large + 3 small = 7.8 Let x be the cost of a small bottle, so $x + 0.65$ is a large
 $2(x + 0.65) + 3x = 7.8$ $2x + 1.3 + 3x = 7.8$
 $5x = 6.5$ $x = 6.5 \div 5$ **A small bottle is \$1.30**