A prescription is written for 300mg of an antibiotic to be given by mouth every 8 hours for 10 days. The antibiotic comes in an oral suspension in a concentration of 100mg/5ml, and is available in a 150 ml bottle. One bottle of antibiotic costs $600.00. The technician did the calculation to determine the number of bottles to reconstitute. They determined they needed 6 bottles and continued with reconstituting the 6 bottles and preparing the labels. On final check the pharmacist was very upset because the technician has cost the pharmacy money because of a poor calculating. How many bottles should have been reconstituted and how much money was lost by the pharmacy?

Solution:

1) First of all we find how many doses of an antibiotic we will need for 10 days.

$$x = 24*10/8 = 30 \text{ (doses)};$$

where 24 hours in a day; 10 days; every 8 hours we must use an antibiotic.

2) If 300 (mg) is one dose of an antibiotic then for all period of time (30 doses) it would be

$$y = 300*30 = 9000 \text{ (mg) of an antibiotic};$$

3) Now we find how many an antibiotic is in one bottle.

in 5 ml suspension – is 100 mg of an antibiotic

in 150 ml suspension – z mg of an antibiotic

Then $z = 150*100/5 = 3000$ (mg) of an antibiotic is in one bottle;

4) Now we calculate how many bottles of an antibiotic suspension we need.

All dose of an antibiotic is 9000 (mg) and in one bottle is 3000 (mg) of an antibiotic then

$$n = 9000/3000 = 3 \text{ (bottles) of an antibiotic suspension we will need.}$$

5) Now we calculate how much money the pharmacy lost.

The pharmacy need 3 (bottles) of an antibiotic suspension but they bought 6 (bottles). It means that 3 (bottles) [6-3 = 3] have been reconstituted. If one bottle of antibiotic costs $600.00 then they lost

$$m = 600*3 = \$1800 \text{ they lost.}$$