Problems:

(1) (a) A pharmacist is to prepare 35 milliliters of special eye drops for a glaucoma patient. The eye-drop solution must contain a concentration of 6% active ingredient, but the pharmacist only has a 10% concentrated solution and a 1% concentrated solution in stock (unlimited quantities of each). Can the pharmacist use the solutions she has in stock to fill the prescription?

(b) The same pharmacist from part (a) receives a large number of orders for special eye drops for glaucoma patients. The prescriptions vary in volume but each requires a concentration of 6% active ingredient. Help the pharmacist find a convenient way to determine the exact amounts of the 10% solution and the 1% solution needed for a given volume of eye drops.

(2) Lola walks to school from her home along a straight path. The distance from her home to the school is 3 kilometers. One day, Lola leaves home at 7 am. She walks at a rate of 6 km per hour until 7:20 am, and then she sits down on a park bench for ten minutes. When she starts walking again, she walks at a rate of 10 km per hour until she arrives at school.

(a) What is Lola’s distance from her home at any given moment during her walk to school?

(b) If Lola’s brother Juan leaves home at 7:10 am and walks to the school along the same path as Lola at a rate of 9 km per hour, will he pass her? If so, at what time?