Problem
Georgina enters a 12 km race. She wants to finish the race in one hour and twenty minutes. She starts off jogging at a speed of 7 km/h. After 30 minutes, she realizes that she needs to increase her speed to finish the race in her desired time. For the remaining time, what speed must she run at to finish the race in exactly one hour and twenty minutes?

Solution
Representing the information in a diagram can be helpful when solving a problem like this.

The total trip is one hour and twenty minutes or 80 minutes. For the first 30 minutes, Georgina travels at a constant rate of 7 km/h. This means that in one hour (60 minutes) she would travel 7 km. Therefore, in half the time or 30 minutes she would travel half the distance or \(7 \div 2 = 3.5\) km.

So Georgina must run \(12 - 3.5 = 8.5\) km in \(80 - 30 = 50\) minutes.

We need to determine the constant rate that Georgina needs to run at to accomplish this. Georgina needs to run 8.5 km in 50 minutes. By dividing each term by 5, Georgina needs to run \(8.5 \div 5 = 1.7\) km in \(50 \div 5 = 10\) minutes. Multiplying each term by 6, Georgina must run \(1.7 \times 6 = 10.2\) km in \(10 \times 6 = 60\) minutes (1 hour).

Therefore, Georgina must run the remaining distance at 10.2 km/h to accomplish her goal of finishing the 12 km race in one hour and twenty minutes.