Task. A tap can fill a tank in 15 minutes and another tap attached to the same tank when opened can empty it in 8 minutes. If both taps are opened at the same time, the tank will be empty in WHAT minutes? or filled in WHAT minutes?

Solution. Let X be the volume of the tank. Then the first tap can fill the tank in 15 minutes, so each minute the volume in tank will be increased by $\frac{X}{15}$.

On the other hand, the second tap can empty the tank in 8 minutes, so each minute the volume in tank will be decresed by $\frac{X}{8}$.

Therefore when both taps are opened, then each minute the volume in the tank will be changed by

$$\frac{X}{15} - \frac{X}{8} = \frac{(8-15)X}{15*8} = -\frac{7}{120}\ X.$$

Thus the volume will be decreased andtank will be empty.

Now suppose that tank was full and we opened both taps. Then it will be empty in

$$\frac{X}{\frac{7}{120}\ X} = \frac{120}{7}\ min. = \frac{120*60}{7}\ sec. \approx 1027\ sec = 17*60+8 = 17\ min\ 8\ sec.$$

Answer. The tank will be empty in 17 minutes and 8 seconds.