

Task. 729 ml of a mixture contains milk and water in the ratio 7:2. How much of the water is to be added to get a new mixture containing half milk and half water?

Solution. Let M be the volume of milk in the 792 ml and W be the volume of water. Then

$$M + W = 792.$$

On the other hand

$$\frac{M}{W} = \frac{7}{2} \quad \Rightarrow \quad M = \frac{7W}{2} = 3.5W.$$

Hence from $M + W = 792$ we obtain

$$3.5W + W = 792$$

$$4.5W = 792$$

$$W = \frac{792}{4.5} = 176 \text{ ml.}$$

Therefore

$$M = 792 - W = 792 - 176 = 616 \text{ ml.}$$

Therefore, in order to get a mixture containing half milk and half water we should add the volume of water

$$\Delta W = M - W = 616 - 176 = 440 \text{ ml.}$$

Then each of the milk and water will have volume 616 ml.

Answer. 440 ml.