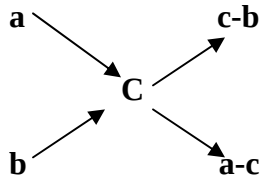
Account interference

First we will do a general task that will help us to solve other such tasks.

You must stir the two types of goods, whose prices are **a** $ per kg and **b** $ per kg, to received the goods at a price of **c** $ per kg,(b<c<a).Determine the scale of this should interfere two types of goods.



scheme

If we take x kg of goods at the price of **a $,** y kg at the cost of **b** $, then:

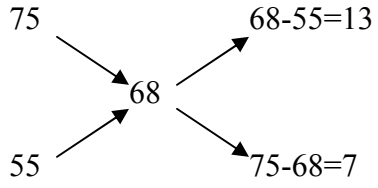
$$x : y = (c - b) : (a - c)$$

1) On the stock has coffee at a price of 75 $ per kg and 55 $ per kg. Create a 120 kg mixture, which will sell at 68 $ per kg.

x kg 75 $

y kg 55 $

=> $x + y = 120kg$



$13k + 7k = 120$

$20k = 120$

$k = 6$

$x = 13 \cdot 6 = 78kg$

$y = 7 \cdot 6 = 42kg$

$x : y = 13 : 7$

$x = 13k$ }

$y = 7k$ }

Of course, this task can be solved with system:

$75 \cdot x + 55 \cdot y = 68 \cdot (x + y)$

$x + y = 120kg$

$75x + 55y = 68 \cdot 120$

$x + y = 120$

$75x + 55y = 8160$

$x + y = 120$

$x = 120 - y \rightarrow$ Express one unknown and change it to another equation

$75(120 - y) + 55y = 8160$

$9000 - 75y + 55y = 8160$

$-75y + 55y = 8160 - 9000$

$-20y = -840$

$y = 42kg$

$x = 120 - 42$

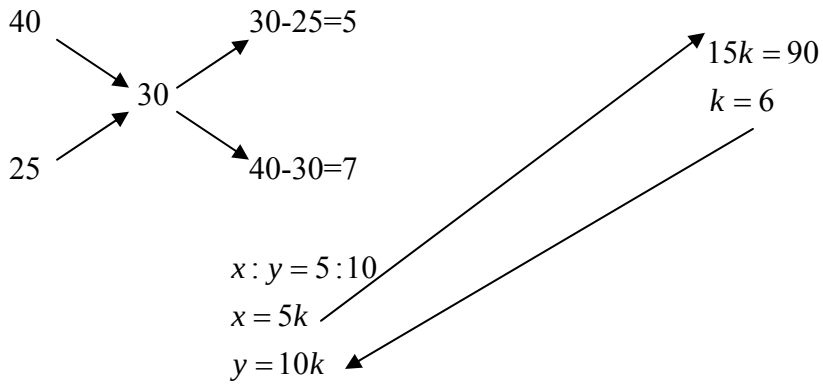
$x = 78kg$

2) How much water temperature $40^0 C$ and water temperature $25^0 C$ should be mixed to obtain 90 liters of water temperature $30^0 C$?

x liters $40^0 C$

y liters $25^0 C$

$\Rightarrow \quad x + y = 90l$



x = 30 *l* and y = 60 *l*

Over systems, would be:

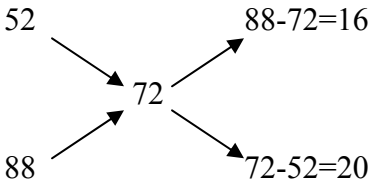
$40 \cdot x + 25y = 90 \cdot 30$

$x + y = 90$

3) How should be mixed acid strength 52% and 88% to get mixture of 144 liters with strenght 72 % ?

xl strenght 52%

yl strenght 88%



$x : y = 16 : 20$

$x = 16k$

$y = 20k$

$x + y = 144$

$16k + 20k = 144$

$36k = 144$

$k = 4$

$x = 16 \cdot 4 = 64l$

$y = 20 \cdot 4 = 80l$

Watch out: When we mix goods with 3 or more different prices, chart does not help!

4) **T**he company has 4 types of flour at the price of 72 $, 48 $, 60 $ and 66 $ per kilogram. How much should be taken of any kind that price is 50 $ per kilogram?

x kg by 72 $
y kg by 48 $
z kg by 60 $
t kg by 66 $

$72x + 48y + 60z + 66t = 50(x + y + z + t)$

$72x + 48y + 60z + 66t = 50x + 50y + 50z + 50t$

$22x - 2y + 10z + 16t = 0$

You can create a large number of scale! $x : y : z : t = ?$ HOW?

Three unknown we take arbitrarily and fourth we calculate:

y=24, z=1 t=1 → arbitrarily chosen

$22x - 48 + 10 + 16 = 0$

$22x = 22$

$x = 1$

So: x: y: z: t = 1:24:1:1