

Tasks percent, alloys and mixtures

Do My Homework

We continue to disassemble the task number 11 from the exam in mathematics. Task number 1.

Mixing 30 percent and 60 percent acid solutions and adding 10 kg of clean water, a 36 percent acid solution was obtained. If 10 kg of a 50% solution of the same acid was added instead of 10 kg of water, then a 41 percent acid solution would be obtained. How many kilograms of a 30 percent solution were used to obtain a mixture?

Solution

Let the mass of a 30% acid solution be "M1" kg, and the mass of 60 percent "M2".

Translate interest in the share of "1":

$$30\% = 0.3$$

$$60\% = 0.6$$

$$36\% = 0.36$$

$$50\% = 0.5$$

$$41\% = 0.41$$

If you mix 30 percent and 60% acid solutions and add 10 kg of clean water, then a 36% acid solution will be obtained.

And we can write:

$$0.3m_1 + 0.6m_2 = 0.36 (M_1 + M_2 + 10)$$

If 10 kg of a 50-percent solution of the same acid was added instead of 10 kg of water, then a 41% acid solution would be obtained:

$$0.3m_1 + 0.6m_2 + 0.5 \cdot 10 = 0.41 (M_1 + M_2 + 10)$$

Resolved the resulting system of equations:

Answer: 60. Task number 2

There are two vessels. The first contains 30 kg, and the second 20 kg of the acid solution of various concentrations. If these solutions are mixed, then a solution containing 68% acid is obtained. If you mix equal masses of these solutions, then a solution containing 70% acid is obtained. How many kilograms of acid is contained in the first vessel?

Solution

Let the concentration of the first acid solution "C1", and the concentration of the second "C2".

Translate interest in the share of "1":

$$68\% = 0.68$$

$$70\% = 0.7$$

If you mix these solutions of acid, then a solution containing 68% acid is obtained.

And we can write:

$$30c_1 + 20c_2 = 50 \cdot 0.68$$

If you mix equal masses of these M solutions, then a solution containing 70% acid is obtained:

$$Mc_1 + Mc_2 = 2M \cdot 0.7$$

Resolved the resulting system of equations:

The acid mass in the first vessel will be equal to:

$$M_1 = C_1 \cdot 30$$

From here we get:

$$M_1 = 0.6 \cdot 30 = 18$$

Answer: 18. Task number 3

Customer A. made a contribution to the bank in the amount of 7,700 rubles. Interest on the deposit are charged once a year and added to the current deposit amount. Exactly a year later, under the

same conditions, the same contribution was made by the Customer B. Anotherly exactly after a year clients A. and B. closed the deposits and took all the accumulated money. At the same time, the client A. received 847 rubles more than the client B. What percentage of annual charged bank for these deposits?

Solution

Let the bank charged $x\%$ per annum.

Then the client A. in two years received:

$$7700 (1 + 0,01x)^2$$

Where:

"1" - Designation 100%

"0,01" - Designation 1%

The bracket in the square indicates that interest was charged two years

Customer B. in one year received:

$$7700 (1 + 0,01x)$$

Denote:

$$y = 1 + 0,01x$$

Then, since A. got 847 rubles. More, we have:

$$7700y^2 - 7700y = 847 \Leftrightarrow$$

$$7700y^2 - 7700y - 847 = 0 \Leftrightarrow$$

$$U_1 = 1,1$$

$$U_2 = - 0.1$$

Since, in the sense of task, $x > 0$,

We get: $y = 1.1$

where:

$$1,1 = 1 + 0,01s$$

$$x = 10.$$

We get that the bank charged the depositors of 10% per annum.

Answer: 10.

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