

Show the work neatly, clearly, systematically, and understandably. Do in 4-step method. 6 points each.

1. Sam invests a portion of \$10,000 in a 7% annual simple interest account and the remainder in a 6% annual simple interest bond. The total annual interest is \$680. Find the amount invested in the 7% account.

I.) Let  $x$  be the amount invested in 7% annual simple interest acct.

II.) Type	Amt	Rate	Interest
7% Annual Act.	$x$	0.07	$0.07x$
6% Bond	$10,000 - x$	0.06	$0.06(10,000 - x)$
	10,000		$680 = 0.07x + 0.06(10,000 - x)$

III.)  $0.07x + 0.06(10,000 - x) = 680$

$0.07x + 600 - 0.06x = 680$

$0.01x + 600 = 680$

$0.01x = 680 - 600$

$0.01x = 80$

$x = \frac{80}{0.01} = \frac{8000}{1}$

$x = 8,000$

IV.) So, \$8,000 was invested in the 7% Account.

2. How many ounces of herbs costing \$1/oz should be mixed with 30 oz. of herbs costing \$2/oz to produce a mixture costing \$1.60/oz?

I.) Let  $x$  be the ounces of \$1/oz herbs.

II.) Type	Amt	Unit Cost	Unit Total
\$1/oz herbs	$x$	1.00	$x$
\$2/oz herbs	30	2.00	60
mixture	$x + 30$	1.60	$1.6(x + 30) = x + 60$

III.)  $1.6(x + 30) = x + 60$

$1.6x + 48 = x + 60$

$1.6x - x = 60 - 48$

$0.6x = 12$

$x = \frac{12}{0.6} = \frac{120}{6}$

$x = 20$

IV.) So, 20 ounces of herbs costing \$1/oz should be used for the mixture.

3. Forty ounces of a 30% gold alloy are mixed with 60 oz. of a 20% gold alloy. Find the percent concentration of resulting gold alloy.

I.) Let  $x$  be the percent concentration of resulting gold alloy.

II.)

TYPE	Amt.	Concentration	Total
30% g. Alloy	40	0.3	12
20% g. Alloy	60	0.2	12
	100	$x$	$100x = 12 + 12$

III.)  $100x = 12 + 12$

$100x = 24$

$x = \frac{24}{100} = \frac{12}{50} = \frac{6}{25}$

$x = 0.24$

$0.24 \times 100\% = \underline{\underline{24\%}}$

$$\begin{array}{r} 0.24 \\ 25 \overline{) 6.0} \\ \underline{50} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

IV.) So, 24% is the resulting concentration of gold alloy.

Show the work neatly, clearly, systematically, and understandably. Do in 4-step method. 6 points each.

1. Sam invests a portion of \$10,000 in a 7% annual simple interest account and the remainder in a 6% annual simple interest bond. The total annual interest is \$680. Find the amount invested in the 7% account.

1) Let  $x$  be the amount invested in the 7% annual simple interest account

type	amount	interest rate	interest
7%	$x$	0.07	$0.07x$
6%	$10000-x$	0.06	$0.06(10000-x)$
			$680 = 0.07x + 0.06(10000-x)$

$$\begin{aligned}
 3) \quad 0.06(10000-x) + 0.07x &= 680 \\
 600 - 0.06x + 0.07x &= 680 \\
 600 - 0.01x &= 680 \\
 0.01x &= 680 - 600 \\
 0.01x &= 80 \\
 x &= \frac{80}{0.01} \\
 x &= 8000
 \end{aligned}$$

4) So, the amount invested in the 7% annual simple interest account is \$8,000.

2. How many ounces of herbs costing \$1/oz should be mixed with 30 oz. of herbs costing \$2/oz to produce a mixture costing \$1.60/oz?

1) Let  $x$  be the amount of herbs costing \$1/oz used in the mixture.

type	amount	cost	value
herb #1	$x$	1.00	$1.00x$
herb #2	30	2.00	$2.00(30)$
		$30+x$	$1.60(30+x) = 1.00x + 2.00(30)$

$$\begin{aligned}
 3) \quad 1.60(30+x) &= 1.00x + 2.00(30) \\
 48.00 + 1.60x &= 1.00x + 60.00 \\
 1.60x - 1.00x &= 60.00 - 48.00 \\
 0.60x &= 12.00 \\
 x &= \frac{12.00}{0.60} \\
 x &= 20
 \end{aligned}$$

4) So, the amount of herbs costing \$1/oz used in the mixture is 20 ounces.

3. Forty ounces of a 30% gold alloy are mixed with 60 oz. of a 20% gold alloy. Find the percent concentration of resulting gold alloy.

1.) Let  $x$  be the percent concentration of the resulting gold alloy.

2.)

type	amount	percent concentration	quantity
30%	40	0.30	$0.30(40)$
20%	60	0.20	$0.20(60)$
	$(60+40)$	$X$	$X(60+40) = 0.30(40) + 0.20(60)$

3.)  $x(60+40) = 0.30(40) + 0.20(60)$

$$60x + 40x = 12 + 12$$

$$100x = 24$$

$$x = \frac{24}{100}$$

$$x = 0.24$$

$$x = 0.24 \times 100\%$$

$$x = 24\%$$

$$\begin{array}{r} 100 \overline{) 24.00} \\ \underline{200} \\ 400 \end{array}$$

4.) So, the percent concentration of the resulting gold alloy is 24%.

Show the work neatly, clearly, systematically, and understandably. Do in 4-step method. 6 points each.

1. Sam invests a portion of \$10,000 in a 7% annual simple interest account and the remainder in a 6% annual simple interest bond. The total annual interest is \$680. Find the amount invested in the 7% account.

2. How many ounces of herbs costing \$1/oz should be mixed with 30 oz. of herbs costing \$2/oz to produce a mixture costing \$1.60/oz?

1. Let  $x$  be the amount of herb 1.

2. Type | Amount | Value | Total Cost

Type	Amount	Value	Total Cost
herbs 1	$x$	1	$x$
herbs 2	30	2	60
	$30+x$	1.60	$1.60(30+x)$
			$x+60=1.60(30+x)$

3.  $x+60 = 1.60(30+x)$

$x+60 = 4.80 + 1.60x$

$60-4.80 = 1.60x - x$

$1.20 = 0.60x$

$\frac{1.20}{0.60} = x$

$2 = x$

$\frac{120}{60} = x$

$20 = x$

4. So, 20 lb's of herbs must be mixed to produce the mixture.

1. Let  $x$  be the amount invested at 7%.

2. Amount at | Principal | Rate | Interest earned

7%	$x$	0.07	$0.07x$
6%	$10000-x$	0.06	$0.06(10000-x)$
	10,000		680
			$0.07x + 0.06(10000-x)$
			$= 680$

3.  $0.07x + 0.06(10000-x) = 680$

$0.07x + 600 - 0.06x = 680$

$0.01x + 600 = 680$

$0.01x = 680 - 600$

$0.01x = 80$

$x = \frac{80}{0.01} \rightarrow \frac{8000}{1}$

$x = 8000$

4. So, Sam invested \$8,000 at 7%.

3. Forty ounces of a 30% gold alloy are mixed with 60 oz. of a 20% gold alloy. Find the percent concentration of resulting gold alloy.

1. Let  $x$  be the concentration for the resulting gold alloy.

2.

Type	Amount	Concentration	Total
30% alloy	40	0.30	12
20% alloy	60	0.20	12
	100	$x$	24
			$24 = 100x$

3.  $24 = 100x$

$$\frac{24}{100} = x$$

$$\boxed{0.24 = x} \rightarrow 0.24 \times 100\%$$

$$\rightarrow \boxed{24\%}$$

4. So, the percent concentration of the resulting gold alloy is 24%.