

## 2.6 Mixture Problems

Prentice Hall Algebra Pages 111-113



Type	Amount (Pounds)	Cost Per Pound ("1 pound cost")	Total Cost
Coffee 1	C	\$7.50	\$7.50 C
Coffee 2	15 - C	\$10	\$10(15 - C)
Mixture	15	\$8.95	\$8.95(15)

$$7.50c + 10(15 - c) = 8.95(15)$$

$$7.50c + 150 - 10c = 134.25$$

$$150 - 2.5c = 134.25$$

$$\begin{array}{r} -150 \\ \hline \end{array} \qquad \begin{array}{r} -150.00 \\ \hline \end{array}$$

$$\begin{array}{r} -2.5c = -15.75 \\ \hline \end{array}$$

$$\begin{array}{r} -2.5 \\ \hline \end{array} \qquad \begin{array}{r} -2.5 \\ \hline \end{array}$$

$$c = 6.3$$

6.3 pounds of Coffee 1 (at \$7.50 per pound)  
and 8.7 pounds of Coffee 2 (at \$10 per pound).

\*Note- textbook solution is incorrect.



Type	Amount (Pounds)	Cost Per Pound ("1 pound cost")	Total Cost
Peanuts	X	\$2.95	\$2.95 X
Almonds	90 - C	\$5.95	\$5.95 (90 - C)
Mixture	90	\$4.50	\$4.50 (90)

$$\begin{aligned}
 2.95x + 5.95(90 - x) &= 4.50(90) \\
 7.50c + 535.50 - 5.95x &= 405 \\
 \mathbf{7.50c} + 535.50 - \mathbf{5.95x} &= 405 \\
 535.50 - 3x &= 405 \\
 \underline{-535.50} & \quad \underline{-535.50} \\
 -3x &= -130.50 \\
 \underline{-3} & \quad \underline{-3} \\
 x &= 43.5
 \end{aligned}$$

**43.5 pounds of Peanuts  
 and 46.5 pounds of Almonds.**

#3

Type	Amount of Solution (Liters)	% Acid of the Solution	Total Amount of Acid
50% Solution	a	50%	.5a
20% Solution	75 - a	20%	.2(75 - a)
Mixture (30% Solution)	75	30%	.3(75)

$$.5a + .2(75 - a) = .3(75)$$

25 Liters of the 50% solution  
 and 50 Liters of the 20% solution.

#4

Type	Amount of Solution (Liters)	%Chlorine of the Solution	Total Amount of Chlorine
30% Solution	x	30%	.3 x
70% Solution	150 - x	70%	.7(150 - x)
Mixture (55% Solution)	150	55%	.55(150)

$$.3x + .7(150 - x) = .55(150)$$

93.75 Liters of the 70% solution

and 56.25 Liters of the 30% solution.

**#s 5 to 7**

Type	Amount of Solution (mL)	% Acid of the Solution	Total Amount of Acid (mL)
35% Solution	x	35%	.35 x
85% Solution	120	85%	.85 (120)
Mixture (75% Solution)	120 + x	75%	.75 (120 + x)

$$.35 x + .85(120) = .75(120 + x)$$

30 liters of the 35% solution.

(not part of the question...) and 90 liters of the 85% solution.

**#9**

Type	Amount (Pounds)	Cost Per Pound ("1 pound cost")	Total Cost
Bananas	6	\$1.99	\$11.94
Apricots	14	X	\$14 X
Mixture	20	\$6.89	\$137.8

$$11.94 + 14 x = 137.8$$

Dried apricots cost \$8.99 per pound.

# #10

Type	Amount (Liters)	Cost Per Pound ("1 Liter cost")	Total Cost
Orange Juice	X	\$1.20	1.2 X
Pear Juice	25 - X	\$1.70	42.5 - 1.7 X
Mixture	25	\$1.40	\$35

$$1.2x + 42.5 - 1.7x = 35$$

$$x = 15$$

Orange Juice: minimum 12.5 Liters & maximum 15 Liters.

Pear Juice: minimum 12.5 Liters & maximum 15 Liters.

# #11

Type	Amount of Solution (mL)	% Acid of the Solution	Total Amount of Acid (mL)
15% Solution	25	15%	3.75
25% Solution	60	25%	15
50% Solution	48	50%	24
Mixture	133	X	133 X

$$3.75 + 15 + 24 = 133x$$

The mixture is an *approximately*  $\approx 32\%$  acid solution.

# #12

Type	Amount of Solution (mL)	% Acid of the Solution	Total Amount of Acid (mL)
45% Solution	32	45%	14.4
15% Solution	18	15%	2.7
Mixture (35% Solution)	50	35%	17.5

No. The red number **in red** above (17.5) would need to be 18.

# #13

Type	Amount of Solution (mL)	% Acid of the Solution	Total Amount of Acid (mL)
20% Solution	230	20%	46
Water	X	0	0
Mixture (15% Solution)	230 + X	15%	.15(230 + X)

$$46 = .15(230 + X)$$

You should add 77 mL of water.