Math 107

Fall 2016

Lecture 14

Mixtures:

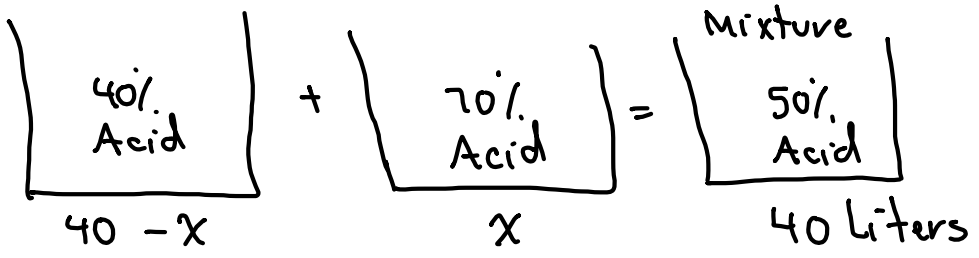
Type A	+	Type B	=	Mixture
\$3/lb.		\$5/lb		\$3.50/lb.
$20-x$		x		20 lb.

we need 20 lb. of mixture

$$3(20-x) + 5x = 3.50(20)$$

Solve for x.

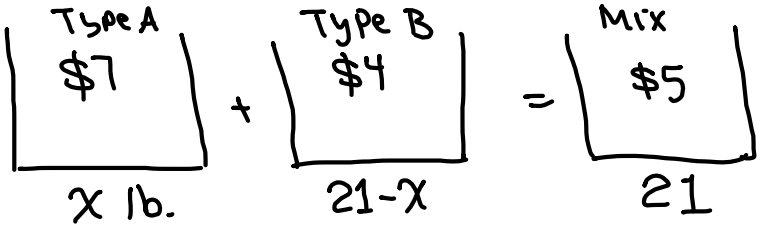
Two acid solutions



$$40\%(40-x) + 70\%x = 50\%(40)$$

we have unlimited supply of two different brand of Coffee. \$7/lb. & \$4/lb.

we need 21 pounds at \$5/lb.



$$7x + 4(21-x) = 5(21)$$

$$7x + 84 - 4x = 105$$

$$3x + 84 = 105$$

$$3x = 105 - 84$$

$$3x = 21$$

$$x = 7$$

7 lb. @ \$7/lb.

14 lb. @ \$4/lb.

I need 40 lb. of candy @ $4/lb.
we have unlimited supply of two types of Candy. One @ $3/lb. and another one @ $5/lb.
How many pounds of each?

$3	+	$5	=	$4
x lb.		$(40-x)$ lb.		40 lb.

20 lb. of each

$$3x + 5(40-x) = 4(40)$$
$$3x + 200 - 5x = 160$$
$$-2x + 200 = 160$$
$$-2x = 160 - 200$$
$$-2x = -40$$
$$x = 20$$

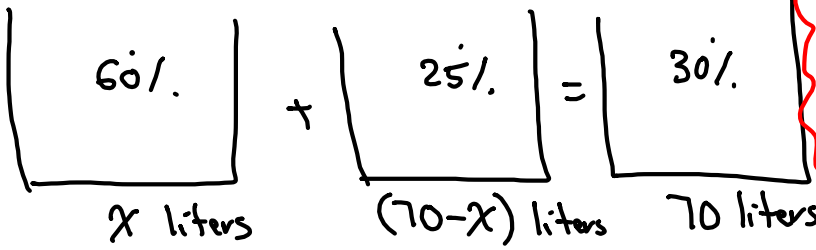
we have two supplies of alcohol solutions. One is pure alchol & the other one is 40% alcohol. we need 50 liters of 70% alcohol.
How many liters of each?

100%	+	40%	=	70%
x		$50-x$		50

25 liters of each

$$100\%\,x + 40\%\,(50-x) = 70\%\,(50)$$
$$100x + 40(50-x) = 70(50)$$
$$100x + 2000 - 40x = 3500$$
$$60x = 3500 - 2000$$
$$60x = 1500$$
$$x = \frac{1500}{60}$$
$$x = 25$$

we need 70 liters of 30% acid.
we have unlimited supply of 25% acid & 60% acid. how many liters of each?



10 liters of 60% acid & 60 liters of 25% acid

$60\% \cdot x + 25\% \cdot (70-x) = 30\% \cdot 70$

$60x + 25(70-x) = 30(70)$

$60x + 1750 - 25x = 2100$

$35x = 2100 - 1750$

$35x = 350$

$x = 10$

we need 30 gallons of 20% alcohol.
we have unlimited supply of 40% & 10% alcohol.
How many gallons of each?

$40\% \cdot x + 10\% \cdot (30-x) = 20\% \cdot (30)$

$40x + 10(30-x) = 20(30)$

$40x + 300 - 10x = 600$

$30x = 600 - 300$

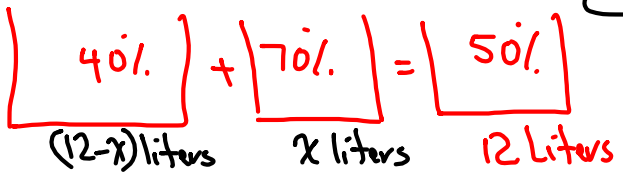
$30x = 300$

$x = 10$

10 gallons of 40% & 20 gallons of 10%

Find how many liters of each using the drawing below?

4 liters @ 70%.
8 liters @ 40%.



$40\%(12-x) + 70\%x = 50\%(12)$

$40(12-x) + 70x = 50(12)$

$480 - 40x + 70x = 600$

$480 + 30x = 600$

$30x = 600 - 480$

$30x = 120$

$x = 4$