

2-9 Weighted Averages
 Example 1 $n = \#$ of lbs of black tea

	lbs	\$	Total
Dried Blackberry	5	10.50	5(10.50)
Black Tea	n ^{7.25}	35.00	35.00 n
Blend	$5+n$ ^{12.25}	25.00	25.00($n+5$)

$$5(10.50) + 35.00(n) = 25.00(n+5)$$

$$52.50 + 35n = 25n + 125.00$$

$$\begin{array}{r} 52.50 + 35n \\ -25n \\ \hline \end{array} \quad \begin{array}{r} 25n + 125.00 \\ -25n \\ \hline \end{array}$$

$$52.50 + 10n = 125.00$$

$$\begin{array}{r} 52.50 + 10n \\ -52.50 \\ \hline \end{array} \quad \begin{array}{r} 125.00 \\ -52.50 \\ \hline \end{array}$$

$$\frac{10}{10}n = \frac{72.50}{10}$$

$$n = 7.25 \text{ lbs}$$

1.) $n = \text{lbs of Premium}$

	lbs	\$	Total
Premium	n (7)	9.50	$9.50n$
Supreme	2	11.75	$11.75(2)$
Blend	$n+2$ (9)	10.00	$10.00(n+2)$

$$9.50n + 11.75(2) = 10.00(n+2)$$

$$9.50n + 23.50 = 10.00n + 20.00$$

$$\begin{array}{r} 9.50n + 23.50 \\ - 20.00 \\ \hline \end{array} = \begin{array}{r} 10.00n + 20.00 \\ - 20.00 \\ \hline \end{array}$$

$$\begin{array}{r} 9.50n + 3.50 \\ - 9.50n \\ \hline \end{array} = \begin{array}{r} 10.00n \\ - 9.50n \\ \hline \end{array}$$

$$\frac{3.50}{0.50} = \frac{0.50n}{0.50}$$

$$7 = n$$

(7 lbs)

Example
2

$n =$ cups of 33%.

	Cups	Amt of Pineapple juice
3%	16	$0.03(16)$
33%	n	$0.33n$
20%	$16+n$	$0.20(16+n)$

$$0.03(16) + 0.33n = 0.20(16+n)$$

$$0.48 + 0.33n = 3.20 + 0.20n$$

$$\quad \quad \quad -0.20n \quad \quad \quad -0.20n$$

$$0.48 + 0.13n = 3.20$$

$$\quad \quad \quad -0.48 \quad \quad \quad -0.48$$

$$\frac{0.13n}{0.13} = \frac{2.72}{0.13}$$

$$n = 20.9 \text{ cups}$$

%
divide by
100
←
2 decimal
places
left

Example 3 $d = r \cdot t$ distance = rate (time)

$$\frac{d}{t} = r$$

$$\frac{d}{r} = t$$

$$\frac{40 \text{ min}}{5 \text{ miles}} \quad \frac{30 \text{ min}}{5 \text{ miles}} = \frac{70 \text{ min}}{10 \text{ miles}}$$

Speed miles per hour.

$$\frac{10 \text{ mi.}}{70 \text{ min}} = \frac{8.57 \text{ miles}}{60 \text{ min.}}$$

$$\approx \frac{8.6 \text{ miles}}{1 \text{ hr.}}$$

Remember $d = r \cdot t$ rate = speed (11)

Speed = $\frac{\text{miles}}{\text{hr.}}$

$r = \frac{d}{t}$

4.)

	r	t	$d = rt$
Cyclist #1	12	t	$12t$
Cyclist #2	18	t	$18t$

$$12t + 18t = 5 \text{ miles}$$

$$\frac{30t}{30} = \frac{5}{30} \text{ miles}$$

$$t = \frac{1}{6} \text{ hours}$$

10 minutes

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1.)

	\$	oz.	total
Soup	0.15	10	$10(0.15)$
Salad	0.20	n	$0.20n$

$$10(0.15) + 0.20n = 3.30$$

$$\begin{array}{r} 1.50 + 0.20n = 3.30 \\ -1.50 \qquad \qquad -1.50 \end{array}$$

$$\frac{0.20n}{0.20} = \frac{1.80}{0.20}$$

$$n = 9$$

9 ounces

2.)

 $n = \# \text{ of ml of } 60\% \text{ solution}$

	ml.	
25%	40	$0.25(40)$
60%	n	$0.60n$
30%	$40+n$	$0.30(40+n)$

$$0.25(40) + 0.60n = 0.30(40+n)$$

$$\cancel{10} + 0.60n = \cancel{12} + 0.30n$$

$$0.60n = 2 + \cancel{0.30n}$$

$$\frac{0.30n}{0.30} = \frac{2}{0.30}$$

$$n = 6.\bar{6}$$

about ≈ 6.7 ml

3.)

$$\begin{array}{r} 16 \text{ miles} \\ + 24 \text{ miles} \\ \hline 40 \text{ miles} \end{array}$$

$$\frac{40 \text{ miles}}{4 \text{ hours}} = \frac{10 \text{ miles}}{1 \text{ hour}}$$

4.)

$$\frac{3 \text{ miles}}{25 \text{ min}} + \frac{3 \text{ miles}}{30 \text{ min.}} = \frac{6 \text{ miles}}{55 \text{ minutes}}$$

$$\frac{6 \text{ mi.}}{55 \text{ min}} = \frac{0.109}{1 \text{ min.}} \approx \frac{0.11 \text{ miles}}{1 \text{ minute}}$$

5.)

$$d = rt$$

	r	t	d
cyclist	18	1 hr.	$18t$
skater	6	1 hr.	$6t$

Clue:
24 miles
apart
subtract

$$18t - 6t = 24 \text{ miles}$$

$$\frac{12t}{12} = \frac{24}{12}$$

$$t = 2 \text{ hours}$$