

1. This is a part-part-whole situation:

$5Y$	$6N$
$11V$	

 where V means votes. Thus, $\frac{517 \cancel{Y}}{1} \cdot \frac{6 \cancel{N}}{11 \cancel{Y}} = 282$ no

votes.

2. A percentage price reduction is a Constant Rate of Decrease: $R(1 - r) = N$ where the rate is applied to the original price. So, let Y be the average price in dollars of a barrel of oil yesterday; $Y(1 - 0.045) = 58.65$.

3. Given: $\frac{4 \text{ db}}{1 \text{ meters}}$ or $\frac{1 \text{ meters}}{4 \text{ db}}$. We want to say something intelligent about N decibels, so we want to convert

that knowledge into length: $\frac{N \cancel{\text{db}} \cdot 1 \cancel{\text{meter}} \cdot 100 \text{ cm}}{1 \cdot 4 \cancel{\text{db}} \cdot 1 \cancel{\text{meter}}} = 25N \text{ cm}$.

4. (i) If it is 70% white chocolate, then it is 30% dark chocolate. So 30% of the 800 grams is dark chocolate: $0.30(800 \text{ g}) = 240$ grams. (ii) The 150 grams of light brown chocolate contains $0.70(150 \text{ g}) = 105$ grams of white chocolate. If we add 60 g of white chocolate to that, we get 165 g of white chocolate in a mixture containing a total of

$150 \text{ g} + 60 \text{ g} = 210$ grams. So the percentage of white chocolate in this new mixture is $\frac{165 \cancel{\text{g}}}{210 \cancel{\text{g}}} \approx 78.57\%$.

5. The distance between two numbers A and B is defined to be $|A - B|$. Here we're told the distance between g and 9 is less than 7 units. Thus, $|g - 9| < 7$.

6. Let M be the number of months you rent the billboard. If $M \leq 6$, you pay $\$120M$. If $M > 6$, then you pay $(\$120)(6) = \720 for the first 6 months, and then for the remaining $M - 6$ months you pay $\$100$ per month.

So, $\left\{ \begin{array}{l} 120M, \quad \text{if } M \leq 6 \\ 720 + 100(M - 6), \text{ if } M > 6 \end{array} \right\}$.

7.

$\frac{A-7}{3}$	$A-7$	A	B
0	0	7	$0 = 0^2$
1	3	10	$1 = 1^2$
2	6	13	$4 = 2^2$
3	9	16	$9 = 3^2$
4	12	19	$16 = 4^2$

$$B = \left(\frac{A-7}{3} \right)^2$$

8. Reviewing the basic concepts here: **Profit = Revenue - Cost**. Revenue = $\left(\frac{\text{price}}{\text{unit}}\right)(\# \text{ units})$; Cost = Fixed Cost + Variable Cost; Variable Cost = $\left(\frac{\text{cost}}{\text{unit}}\right)(\# \text{ units})$. In this case let M be the number of Monaps made (and sold).

$$R = \left(\frac{\$6.75}{1 \text{ unit}}\right)(M \text{ units}) = \$6.75M; \text{ FC} = \$400; \text{ VC} = \left(\frac{\$0.79}{1 \text{ unit}}\right)(M \text{ units}) = \$0.79M. \text{ So}$$

$$P = R - C = 6.75M - (400 + 0.79M). \text{ We want } P \text{ to be } 12\% \text{ of } C, \text{ i.e., } P = 0.12C.$$

$$\text{Thus, } 6.75M - (400 + 0.79M) = 0.12(400 + 0.79M).$$

9. (i) The original ratio is $\frac{\frac{5}{4} \text{ M inch}}{300 \text{ A yd}}$ which simplifies to $\frac{1 \text{ M inch}}{240 \text{ A yds}}$.

(ii) $\frac{80 \cancel{\text{ A ft}} \cdot 1 \cancel{\text{ yd}} \cdot 1 \text{ M inch}}{1 \cdot 3 \cancel{\text{ ft}} \cdot 240 \cancel{\text{ A yd}} \cdot 9} = \frac{1}{9}$ inches on the map. (iii) $\frac{25}{6} \text{ M inch} = \frac{25 \cancel{\text{ M inch}} \cdot 240 \text{ A yd}}{6 \cdot 1 \cancel{\text{ M inch}}} = 1000$ actual yards.

10. The percent change formula is $\frac{N - R}{R}$ where N is the New value and R is the Original value. So, here we have $\frac{6.8 - 6.3}{6.3} \approx 7.9\%$