

## Solving Worded Problems Comparing Prices of Two Plans or Revenue of Two Companies

These problems are different in two ways from investment, mixture, and number of item problems. The first difference is that a chart/table is usually not used. The second difference is that there is not a one variable for one company and one variable for another company. Both companies or plans share the same two variables. A rate per minute, day, year is given for each company. A starting amount or a flat fee is also given for each company. The problems then want to at what time, the plans or companies have the same amounts.

Let  $x$  = the number of minutes, days, years, etc.  
Let  $y$  = the amount of revenue or amount of bill.

$$y = \langle \text{given rate per minute, day, year of 1st company} \rangle x + \langle \text{starting amount or flat fee of 1st company} \rangle$$
$$y = \langle \text{given rate per minute, day, year of 2nd company} \rangle x + \langle \text{starting amount or flat fee of 2nd company} \rangle$$

### Example: 5.2:64

Company A's revenue this fiscal year is \$840,000, but its revenue is decreasing by \$14,000 each year. Company B's revenue this fiscal year is \$180,000, and its revenue is increasing by \$19,000 each year.

Let  $x$  = the number of years.  
Let  $y$  = the revenue each year.

$$\begin{cases} y = -14,000x + 840,000 & (\text{Company A}) \\ y = 19,000x + 180,000 & (\text{Company B}) \end{cases}$$

### Example: 5.3:46

Phone Company A charges a monthly fee of \$35.80, and \$0.03 for each minute of talk time. Phone Company B charges a monthly fee of \$25.00, and \$0.07 for each minute of talk time.

Let  $x$  = the number of minutes.  
Let  $y$  = the cost per month.

$$\begin{cases} y = 0.03x + 35.80 & (\text{Company A}) \\ y = 0.07x + 25.00 & (\text{Company B}) \end{cases}$$