

**Challenge: Skills and Applications**

For use with pages 398–403

In Exercises 1–2, decide whether the ordered pair is a solution of the system of linear equations.

$$1. \begin{cases} 8x - 6y = 2 \\ 7x + 2y = 4\frac{1}{2} \end{cases} \quad \left(\frac{1}{2}, \frac{1}{3}\right)$$

$$2. \begin{cases} 4x - 5y = \frac{2}{3} \\ 9x - 4y = 4\frac{2}{5} \end{cases} \quad \left(\frac{2}{3}, \frac{2}{5}\right)$$

In Exercises 3–4, use the table below, which gives the numbers of users of two Internet providers in a small town.

	1995	2000
<i>Provider A</i>	345	580
<i>Provider B</i>	273	628

- For each provider, write a linear model to represent the number of users at time  $t$ , where  $t$  represents the number of years since 1995.
- Use a graph to estimate when the two providers had the same number of users.

In Exercises 5–7, use the information in the table, which gives the population of three cities based on July 1994 estimates and gives the growth rate of each city.

<i>City</i>	<i>Population</i>	<i>Growth rate</i> (people per year)
<i>City A</i>	547,725	−25,195
<i>City B</i>	493,559	27,146
<i>City C</i>	237,612	12,831

- For each city, write a linear model to represent the population of the city at time  $t$ , where  $t$  represents the number of years since 1994.
- Use a graph to estimate when City A and City B should have the same population.
- Use a graph to estimate when City A and City C should have the same population.