4 EXAMPLE Real-World Connection

Volunteerism Tim can stuff envelopes three times as fast as his daughter Georgia. They have to stuff 5000 envelopes for a fund-raiser. Working together, Tim and Georgia can complete the job in about four hours. How many hours would it take each of them working alone?

Relate Tim's rate + Georgia's rate = combined rate

Define

	Time (hr)	Rate (envelopes per hour)
Tim	x	$\frac{5000}{x}$
Georgia	$3x$	$\frac{5000}{3x}$
Combined	4	$\frac{5000}{4} = 1250$

Write $\frac{5000}{x} + \frac{5000}{3x} = 1250$

Method 1 Use a graphing calculator. Graph $y_1 = \frac{5000}{x} + \frac{5000}{3x}$ and $y_2 = 1250$ in a window with Xmin = 3, Xmax = 10, Ymin = 0, and Ymax = 2000. Then use the INTERSECT feature to find the intersections of the two graphs. The graphs intersect at $x \approx 5.33$.

Method 2 Use a graphing calculator and $y_1 = \frac{5000}{x} + \frac{5000}{3x} - 1250$. Use the TABLE feature and "zoom in" on the point where the function changes sign. This occurs at $x \approx 5.33$.

Tim could stuff 5000 envelopes in about 5.33 hours.

Georgia could stuff 5000 envelopes in 3(5.33) hours, or about 16 hours.

for Help

elp with solving tions by tables, see n 5-5.

CA Standards Check

4 a. Suppose Maria can stuff envelopes twice as fast as her friend Paco. Together, they can stuff 6750 envelopes in 4.5 hours. How long would it take each of them working alone?

b. Suppose Adrian can weed the garden twice as fast as his son Phillip. Together they can weed the garden in 3 hours. How long would it take each of them working alone?

EXERCISES

For more exercises, see *Extra Skill and Word Problem Practice.*

Standards Practice

ALG2 7.0

Practice by Example

for Help Example 1 (page 530)

Solve each equation. Check each solution.

1. $\frac{x}{5} = \frac{x+3}{8}$

2. $\frac{1}{5x} = \frac{1}{9x}$

3. $\frac{4}{3x+3} = \frac{12}{x^2-1}$

4. $\frac{2}{x-1} = \frac{x+4}{3}$

5. $\frac{3}{x+1} = \frac{1}{x^2-1}$

6. $\frac{4}{2x-3} = \frac{x}{5}$

7. $\frac{3}{x} = \frac{12}{x+7}$

8. $\frac{10}{6x+7} = \frac{6}{2x+9}$

9. $\frac{2}{3x-5} = \frac{4}{x-15}$