**Lesson 9-6**

**Example 1 Writing Systems of Equations**
**ANIMALS An animal shelter has 23 cats and dogs available for adoption. The number of dogs is 7 more than the number of cats. Write a system of equations that represents the number of dogs and cats available for adoption.**

Let $c$ = the number of cats, and let $d$ = the number of dogs.

| number of cats | plus | number of dogs | equals | total number of animals |
|---|---|---|---|---|
| $c$ | + | $d$ | = | 23 |

| number of dogs | equals | number of cats | plus | 7 |
|---|---|---|---|---|
| $d$ | = | $c$ | + | 7 |

So, the system of equations is $c + d = 23$ and $d = c + 7$.

**Example 2 Writing Systems of Inequalities**
**TELEVISION Mason is comparing the costs of satellite television. He wants to pay less than $650 for the first year of service. Company A charges $9.99 for each receiver installed in the house, plus $34.95 per month. Company B charges $5.99 for each receiver installed in the house, plus $50.95 per month. Write a system of inequalities to represent the costs for both companies.**

Let $x$ = the number of receivers in the house, and let $y$ = the number of months of service.

| Cost per receiver times number of receivers | plus | cost per month times number of months | is less than | $650. |
|---|---|---|---|---|
| $9.99x$ | + | $34.95y$ | < | 650 |
| $5.99x$ | + | $50.95y$ | < | 650 |

So, the system of inequalities is
$9.99x + 34.95y < 650$
$5.99x + 50.95y < 650$.