

## Solving Equations with Decimals

### Solving Equations

The properties of equations discussed earlier are restated here.

The same number can be added to each side of an equation without changing the solution of the equation.

Each side of an equation can be multiplied by the same nonzero number without changing the solution of the equation.

Each side of an equation can be divided by the same nonzero number without changing the solution of the equation.

Solve:  $3.4 = a - 3.56$

3.56 is being subtracted from the variable a.

Add 3.56 to each side of the equation.

a is alone on the right side of the equation.

The number on the left side is the solution.

$$3.4 = a - 3.56$$

$$3.4 + 3.56 = a - 3.56 + 3.56$$

$$6.96 = a$$

The solution is 6.96

Solve:  $-1.25y = 3.875$

The variable is being multiplied by  $-1.25$ .

Divide each side of the equation by  $-1.25$ .

y is alone on the left side of the equation.

The number on the right side is the solution

$$-1.25y = 3.875$$

$$(-1.25y)/(-1.25) = (3.875)/(-1.25)$$

$$Y = -3.1$$

The solution is  $-3.1$

**Example 1** Solve:  $4.56 = 9.87 + z$

**Solution**       $4.56 = 9.87 + z$

$$4.56 - 9.87 = 9.87 - 9.87 + z$$

$$-5.31 = z$$

The solution is  $-5.31$

## Applications

### Example 3

The costs of operating an electrical appliance is given by the formula  $c = wtk/1000$ , where  $c$  is the cost of operating the appliance,  $w$  is the number of watts,  $t$  is the number of hours, and  $k$  is the cost per kilowatt-hour. Find the cost per kilo-watt if it costs \$.60 to operate a 2000-watt television for 5 hours.

### Strategy

To find the cost per kilowatt-hour, replace  $c$  by 0.60,  $w$  by 2000, and  $t$  by 5 in the given formula and solve for  $k$ .

### Solution

$$c = wtk/1000$$

$$0.60 = 2000(5)k/1000$$

$$0.60 = 10k$$

$$0.60/10 = 10k/10$$

$$0.06 = k$$

It costs \$.06 per kilowatt-hour.