

# 3-2 Study Guide and Intervention

## Rational Numbers

**Write Rational Numbers as Fractions** A number that can be written as a fraction is called a **rational number**. Mixed numbers, integers, terminating decimals, and repeating decimals can all be written as fractions. Any number that can be expressed as  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b \neq 0$  is a rational number.

**Example** Write each number as a fraction.

a.  $3\frac{2}{5}$

$$3\frac{2}{5} = \frac{17}{5}$$

Write the mixed number as an improper fraction.

b.  $-7$

$$-7 = -\frac{7}{1}$$

The denominator is 1.

c.  $0.14$

$0.14$  is 14 hundredths.

$$0.14 = \frac{14}{100} \text{ or } \frac{7}{50}$$

Simplify.

d.  $0.\overline{5}$

$$0.\overline{5} = 0.555\dots$$

$$N = 0.555\dots$$

Let  $N$  represent the number.

$$10N = 5.555\dots$$

Multiply each side by 10 because one digit repeats.

$$10N = 5.555\dots$$

$$\underline{-(N = 0.555\dots)}$$

Subtract  $N$  from  $10N$ .

$$9N = 5$$

$$\frac{9N}{9} = \frac{5}{9}$$

Divide each side by 9.

$$N = \frac{5}{9}$$

Simplify.

### Exercises

Write each number as a fraction.

1.  $1\frac{1}{5}$

2.  $-2$

3.  $0.7$

4.  $0.32$

5.  $-0.\overline{1}$

6.  $0.\overline{49}$

7.  $5.28$

8.  $-7\frac{5}{6}$

9.  $0.\overline{68}$

10.  $-9.08$

11.  $-0.0\overline{6}$

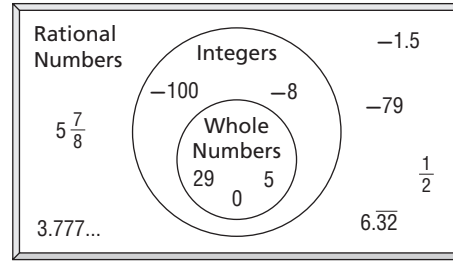
12.  $6\frac{8}{11}$

# 3-2 Study Guide and Intervention *(continued)*

## Rational Numbers

### Identify and Classify Rational Numbers

Numbers can be classified into a variety of different sets. The diagram at the right illustrates the relationships among the sets of whole numbers, integers, and rational numbers.



Decimal numbers such as  $\pi = 3.141592\dots$  and  $6.767767776\dots$  are infinite and nonrepeating. They are called **irrational** numbers.

### Example Identify all sets to which each number belongs.

- a.  $-0.08$  This is neither a whole number nor an integer. Since  $-0.08$  can be written as  $-\frac{8}{100}$ , it is rational.
- b.  $19$  This is a whole number, an integer, and a rational number.
- c.  $8.282282228\dots$  This is a nonterminating and nonrepeating decimal. So, it is irrational.
- d.  $-8$  This is an integer and a rational number.

### Exercises

#### Identify all sets to which each number belongs.

- |                       |                      |                       |
|-----------------------|----------------------|-----------------------|
| 1. $-12$              | 2. $8.5$             | 3. $582$              |
| 4. $0$                | 5. $-68$             | 6. $\frac{1}{5}$      |
| 7. $8.98$             | 8. $4.7829381\dots$  | 9. $2,038$            |
| 10. $-1.45$           | 11. $\frac{99}{5}$   | 12. $4.\overline{34}$ |
| 13. $9.09090909\dots$ | 14. $-13\frac{1}{9}$ | 15. $-739$            |