



Name \_\_\_\_\_ Date \_\_\_\_\_

## Rational Numbers and Decimals

(Pages 249–252)

A decimal that ends, such as 0.335, is a **terminating decimal**.

All terminating decimals are rational numbers.  $0.335 = \frac{335}{1,000}$

A decimal that repeats, such as 0.333... is a **repeating decimal**.

You can use bar notation to show that the 3 repeats forever.  $0.333... = 0.\overline{3}$

All repeating decimals are rational numbers.  $0.333... = \frac{1}{3}$

### EXAMPLES

**A** Express  $0.\overline{47}$  as a fraction in simplest form.

$$\text{Let } N = 0.\overline{47}$$

$$\text{Then } 100N = 47.\overline{47}$$

$$\begin{array}{r} 100N = 47.\overline{47} \\ -1N = 0.\overline{47} \\ \hline \end{array} \text{ Subtract.}$$

The result is  $99N = 47$ . Divide each side by 99.

$$N = \frac{47}{99}$$

**B** Express 4.5 as a fraction or mixed number in simplest form.

4.5 is 4 and 5 tenths or  $\frac{45}{10}$ .

The GCF of 45 and 10 is 5.

Divide numerator and denominator by 5.

$$\frac{45}{10} = \frac{9}{2} \text{ or } 4\frac{1}{2}$$

### Try These Together

1. Express 0.757575... using bar notation.

*HINT: Write a bar over the digits that repeat.*

2. Express 0.4111... using bar notation.

*HINT: Which digit repeats?*

### PRACTICE

**Express each decimal using bar notation.**

3. 6.015015015...

4. 8.222...

5. 0.636363...

**Write the first ten decimal places of each decimal.**

6.  $0.\overline{13}$

7.  $1.\overline{562}$

8.  $3.\overline{498}$

**Express each fraction or mixed number as a decimal.**

9.  $\frac{1}{8}$

10.  $\frac{2}{5}$

11.  $3\frac{1}{3}$

12.  $5\frac{7}{9}$

**Express each decimal as a fraction or mixed number in simplest form.**

13. 0.96

14. 1.25

15.  $0.\overline{8}$

16.  $4.\overline{3}$

17. **Sales** Jack's Suit Shop is having a sale on men's suits. They are  $\frac{1}{5}$  off of regular price for one week only. Express  $\frac{1}{5}$  as a decimal.



18. **Standardized Test Practice** Brandy is 2.75 times as old as her brother Evan. Express 2.75 as a mixed number.

**A**  $2\frac{7}{9}$

**B**  $2\frac{5}{8}$

**C**  $2\frac{2}{5}$

**D**  $2\frac{3}{4}$

Answers: 1.  $0.\overline{75}$  2.  $0.\overline{41}$  3.  $6.\overline{015}$  4.  $8.\overline{2}$  5.  $0.\overline{63}$  6.  $0.\overline{1313131313}$  7.  $1.\overline{5625625625}$  8.  $3.\overline{4989898989}$  9.  $0.\overline{125}$  10.  $0.\overline{4}$  11.  $3\frac{1}{3}$  12.  $5\frac{7}{9}$  13.  $\frac{24}{25}$  14.  $1\frac{1}{4}$  15.  $\frac{9}{10}$  16.  $4\frac{3}{10}$  17.  $0.2$  18. D