## Changing Fractions to Decimals

To change a fraction to a decimal, divide the denominator into the numerator after you put a decimal point and a few zeros to the right of the numerator. When you divide, bring the decimal point up into your answer.

*Example:* Change $\frac{3}{4}$ to a decimal.

1. Add a decimal point and two zeros to the top number (3): 3.00
2. Divide the bottom number (4) into 3.00:
   Bring the decimal point up into the answer:

```
      .75
   4)3.00
     2 8
       20
       20
        0
```

3. The quotient (result of the division) is the answer: .75

Some fractions may require you to add many decimal zeros in order for the division to come out evenly. In fact, when you convert a fraction like $\frac{2}{3}$ to a decimal, you can keep adding decimal zeros to the top number forever because the division will never come out evenly. As you divide 3 into 2, you will keep getting 6s:

$$2 \div 3 = .6666666666 \text{ etc.}$$

This is called a **repeating decimal** and it can be written as $.66\overline{6}$ or as $.66\frac{2}{3}$. You can approximate it as .67, .667, .6667, and so on.

## Changing a Fraction to a Percent and Vice Versa

To change a fraction to a percent, there are two techniques. Each is illustrated by changing the fraction $\frac{1}{4}$ to a percent:

*Technique 1:* Multiply the fraction by 100%.

Multiply $\frac{1}{4}$ by 100%: $\frac{1}{\cancel{4}_{1}} \times \frac{\overset{25}{\cancel{100}\%}}{1} = 25\%$.

*Technique 2:* Divide the denominator into the numerator; then, move the decimal point two places to the right and tack on a percent sign (%).

Divide 4 into 1 and move the decimal point two places to the right:

$$4\overline{)1.00}\quad .25$$

$.25 = 25\%$

To change a percent to a fraction, remove the percent sign and write the number over 100. Then, reduce if possible.

*Example:* Change 4% to a fraction.

1. Remove the % and write the fraction 4 over 100: $\frac{4}{100}$
2. Reduce: $\frac{4 \div 4}{100 \div 4} = \frac{1}{25}$

*Example:* Change $16\frac{2}{3}\%$ to a fraction.

1. Remove the % and write the fraction $16\frac{2}{3}$ over 100: $\frac{16\frac{2}{3}}{100}$
2. Since a fraction means "numerator divided by denominator," rewrite the fraction as a division problem: $16\frac{2}{3} \div 100$
3. Change the mixed number ($16\frac{2}{3}$) to an improper fraction ($\frac{50}{3}$): $\frac{50}{3} \div \frac{100}{1}$
4. Flip the second fraction ($\frac{100}{1}$) and multiply: $\frac{\overset{1}{\cancel{50}}}{3} \times \frac{1}{\underset{2}{\cancel{100}}} = \frac{1}{6}$