

## Section 1.6 Division with Whole Numbers

**1. Notation:** Division can be written in four ways. For example, to write ten divided by five, we could write any of the following:

$$10 \div 5 \text{ or } \frac{10}{5} \text{ or } 10 \overline{)5} \text{ or } 5 \overline{)10}$$

**2. Vocabulary:** The quotient of a and b is

$$a \div b \text{ (or } \frac{a}{b} \text{ or } a \overline{)b} \text{ or } b \overline{)a}).$$

The number that you are dividing into, the "a" in this case is the dividend, the number that you are dividing by, the "b" in this case is the divisor, and the quotient is  $a \div b$  (or  $\frac{a}{b}$  or  $a \overline{)b}$  or  $b \overline{)a}$ ).

English words	Math symbols
10 divided by 5	
23 divided by 8	
8 divided by 25	
x divided by 5	
the quotient of 12 and 3	
the quotient of 12 and x	

### 3. The Meaning of Division

Division is repeated subtraction. Twelve divided by four is three since  $12 - 4 - 4 - 4 = 0$ . In words, you can subtract three fours from twelve before you get to a number that is smaller than four. The last number, the one that is smaller than four is called the remainder. In this case the remainder is zero.

You can check any division problem by multiplication.

$$35 \div 4 = 8 \text{ R.}3, \text{ so } 8 \bullet 4 + 3 = 35$$

**4. Division Algorithm:** Please review the division algorithm on page 58 of your textbook.

Example: Simplify.

a.  $4606 \div 49$

b.  $\frac{17595}{45}$

**5. Division by Zero:** Division by zero is undefined, but zero divided by any number other than zero is zero. Thus,

$$0 \div 5 = 0 \quad \text{and} \quad 5 \div 0 \text{ is undefined.}$$

Example: Simplify:

a.  $8 \div 0$

b.  $16 \div 0$

c.  $0 \div 12$

d.  $\frac{13}{0}$

e.  $\frac{0}{2}$

Example: Write a division expression that gives 0 as an answer.

Example: Write a division expression that is not defined.