

DIVISION

Obj. To learn terms associated with division and learn how division can be defined

Naming Parts of Division

$$\begin{array}{r} \text{Quotient} \\ \text{divisor} \overline{) \text{dividend}} \end{array} \qquad 4 \overline{) 12} \begin{array}{r} 3 \\ \hline \end{array}$$

OR

$$\frac{\text{dividend}}{\text{divisor}} = \text{Quotient} \qquad \frac{12}{4} = 3$$

OR

$$\text{dividend} \div \text{divisor} = \text{Quotient}$$

$$12 \div 4 = 3$$

When you divide, you are trying to find how many things are in a group OR the number of groups.

Division can be defined as repeated subtraction

Ex. How many 2's are there in 8?

Writing that mathematically

$$2 \overline{)8}$$

$$\begin{array}{r} 8 \\ - 2 \\ \hline 6 \\ - 2 \\ \hline 4 \\ - 2 \\ \hline 2 \\ - 2 \\ \hline 0 \end{array}$$

Subtracting 2 four times, so

$$2 \overline{)8}^4$$

Ex $3 \overline{)15}$

Subtract 3
five times

$$\begin{array}{r} 15 \\ - 3 \\ \hline 12 \\ - 3 \\ \hline 9 \\ - 3 \\ \hline 6 \\ - 3 \\ \hline 3 \\ - 3 \\ \hline 0 \end{array}$$

$$3 \overline{)15}^5$$

Fact Families

$$\begin{array}{lcl} \text{Ex.} & 3 \times 5 = 15 & \begin{array}{l} \swarrow 15 \div 5 = 3 \\ \searrow 15 \div 3 = 5 \end{array} \end{array}$$

$$\begin{array}{lcl} \text{Ex} & 4 \times 2 = 8 & \begin{array}{l} \swarrow 8 \div 2 = 4 \\ \searrow 8 \div 4 = 2 \end{array} \end{array}$$

$$\begin{array}{lcl} \text{Ex} & 3 \times 9 = 27 & \begin{array}{l} \swarrow 27 \div 9 = 3 \\ \searrow 27 \div 3 = 9 \end{array} \end{array}$$

*** To have greater success dividing, students need to know the multiplication facts and be able to convert those facts to fact families.

$$\begin{array}{lcl} \text{Ex} & 9 \times 8 = 72 & \begin{array}{l} \swarrow 72 \div 8 = 9 \\ \searrow 72 \div 9 = 8 \end{array} \end{array}$$

Long Division (Single Digit)

Ex. $4 \overline{) 328}$

Using money, can I divide 3 hundreds, 2 tens, and 8 ones between 4 people?

$$4 \overline{) 3(\text{hundreds}) + 2(\text{tens}) + 8(\text{ones})}$$

Since I can not divide 3 hundreds between 4 people, I will change the hundreds into tens.

$$4 \overline{) 0(\text{hundreds}) + 32(\text{tens}) + 8(\text{ones})}$$

Now dividing 32 (tens) between 4 people, each person gets 8 (tens)

$$4 \overline{) 0(\text{hundreds}) + 32(\text{tens}) + 8(\text{ones})} \quad \begin{array}{c} 8(\text{tens}) \end{array}$$

Divide 8 (ones) by 4 people, each person gets 2 (ones)

$$4 \overline{) 0(\text{hundreds}) + 32(\text{tens}) + 8(\text{ones})} \quad \begin{array}{c} 8(\text{tens}) + 2(\text{ones}) \end{array}$$

$$\begin{array}{r} 82 \\ 4 \overline{) 328} \end{array} \quad \text{OR}$$

Note Well

$$\begin{array}{r} 82 \\ 4 \overline{) 328} \end{array}$$

Notice in the problem, each person received 8(tens)!?

In math, we don't write out place value using words. Since the 8 represents tens, it MUST be written in the tens column.

Ex.

$$5 \overline{) 205}$$

Divide 2 hundreds + 0 tens + 5 ones.

Again, you can not divide 2 hundreds between 5 people. Therefore change the 2 hundreds into 20 tens.

Now each person gets 4 tens.

$$\begin{array}{r} 4 \\ 5 \overline{) 205} \end{array}$$

The 4 is placed in the tens column.

$$\begin{array}{r} 41 \\ 5 \overline{) 205} \end{array}$$

Ex $6 \overline{)186}$

Divide 6 into 18 tens

$$\begin{array}{r} 3 \\ 6 \overline{)186} \end{array}$$

Now divide 6 into 6 ones

$$\begin{array}{r} 31 \\ 6 \overline{)186} \end{array}$$

Procedure - long Division

1. Determine where 1st # in the quotient should be placed
2. Divide
3. Multiply
4. Subtract
5. Bring down next # in dividend

Ex

$$7 \overline{)427}$$

$$\begin{array}{r} 6 \\ 7 \overline{)427} \end{array}$$

$$\begin{array}{r} 6 \\ 7 \overline{)427} \\ 42 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 61 \\ 7 \overline{)427} \\ 42 \\ \hline 07 \\ 7 \\ \hline 0 \end{array}$$

Ex

$$\begin{array}{r} 1 \\ 9 \overline{) 135} \\ \underline{9} \\ 4 \end{array}$$

$$\begin{array}{r} 1 \\ 9 \overline{) 135} \\ \underline{9} \\ 45 \end{array}$$

→

$$\begin{array}{r} 15 \\ 9 \overline{) 135} \\ \underline{9} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

Why did the 1 go above the 3?

Ex

$$8 \overline{) 583}$$

$$\begin{array}{r} 7 \\ 8 \overline{) 583} \\ \underline{56} \\ 2 \end{array}$$

→

$$\begin{array}{r} 72 \\ 8 \overline{) 583} \\ \underline{56} \\ 23 \\ \underline{16} \\ 7 \end{array}$$

Answer is 72 with a remainder of 7.

Ex

$$5 \overline{) 2347}$$

①

$$\begin{array}{r} 4 \\ 5 \overline{) 2347} \\ \underline{20} \\ 34 \end{array}$$

②

$$\begin{array}{r} 46 \\ 5 \overline{) 2347} \\ \underline{20} \\ 34 \\ \underline{30} \\ 47 \end{array}$$

Why did the 4
go above the 3?

③

$$\begin{array}{r} 468 \\ 5 \overline{) 2347} \\ \underline{20} \\ 34 \\ \underline{30} \\ 47 \\ \underline{40} \\ 7 \end{array}$$

Looking ahead to decimals, placement
of #'s in the quotient is very
important! — Place Value