Remember that multiplication is just repeated addition. Division is the reverse of multiplication.

Technology Integrated Mathematics
Class Notes
Pre-Algebra: Multiplication and Division of Signed Numbers (Section 6.3)

Multiplication:
Recall, that the product of two positive numbers will be positive and can be thought of as a shortcut to repeated addition. For example, 6×3 is equal to $3 + 3 + 3 + 3 + 3 + 3$ or 18.

If we do the related problem $6 \times (-3)$, we can write it as $(-3) + (-3) + (-3) + (-3) + (-3) + (-3)$. What does that make?

Notice how the product of a positive number and a negative number *must* be negative.

Can we come up with a similar rule for the *product of two negative numbers*? You may recall a mnemonic device. Regardless, let's look at a pattern to firm up this notion.

$-5 \times 3 = -15$
$-5 \times 2 = -10$
$-5 \times 1 = -5$
$-5 \times 0 = 0$
$-5 \times -1 = ??$
$-5 \times -2 = ??$

Each time we decrease the multiplier by 1, our answer increases by 5. So, what are the last two answers?

We must remember that the product of two negative numbers *must* be positive. Keep that in mind as we progress.

The book recalls absolute value to make up a rule for multiplying these numbers. **Multiply the numbers' absolute values and then apply the sign using what we saw earlier.**

expl 1: Multiply.
a.) 8×-5 b.) -5×-13

c.) $\frac{3}{5} \times \left(-\frac{2}{3}\right)$ d.) $(+8) \times -5$

Parts a and d are the same, aren't they? The book sometimes uses the + sign to make positive numbers more obvious.

Division:
Recall that division is the reverse of multiplication. We have these rules for quotients.

Divide two negative numbers and the quotient *must* be positive.

Divide a positive number by a negative number (or vice versa) and the quotient *must* be negative.

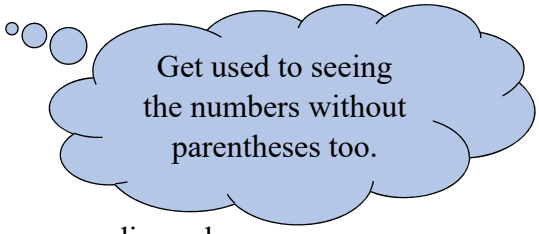
Again, the book uses absolute value for their rule. **They will say to divide the absolute values of the numbers and then assign the appropriate sign.**

expl 2: Divide.
a.) (–45) ÷ (+5)

b.) (–45) ÷ (–5)

c.) $\frac{3}{5} \div \left(-\frac{2}{3}\right)$

d.) –50 ÷ –10



You will also see problems that require a calculator and have rounding rules.

expl 3: Divide. Round to the nearest hundredth.
–3.50 ÷ –1.04

expl 4: An airplane descends from 42,000 feet to 20,000 feet in 12 minutes. Give its rate of change in altitude in feet per minute as a *signed* number.

Worksheet: Multiplying and Dividing Signed Numbers:
This worksheet will give us practice problems.