1.7

Multiplication of Real Numbers

Positive · Positive = Positive
Positive · Negative = Negative
Negative · Positive = Negative
Negative · Negative = Positive

Or

if they have the same sign, product is positive
if they have different signs, product is negative

ex $(4)(5)=20$ $(-4)(5)=-20$
$(-4)(-5)=20$ $(4)(-5)=-20$

Forget about the signs when multiplying, then apply above rule.

The Commutative Property of Multiplication

If a,b real then $ab=ba$

The Associative Property of Multiplication

If a,b,c real then $(ab)c=a(bc)$

Multiplying Multiple Numbers

take 'em 2 at a time.

Multiplication of 0 and 1

if a is real then $a \cdot 0 = 0$ and $0 \cdot a = 0$
$a \cdot 1 = a$ and $1 \cdot a = a$

Division of Real Numbers

positive ÷ positive = positive
positive ÷ negative = negative
negative ÷ positive = negative
negative ÷ negative = positive

or

the division of same sign is positive
the division of different sign is negative

(ex) $10/2 = 5$ $\quad -10/2 = -5$
$10/-2 = -5$ $\quad -10/-2 = 5$

If a real then $\frac{a}{1} = a$ and $\frac{a}{a} = 1$ $(a \neq 0)$

You CANNOT DIVIDE BY ZERO!
why? Notice $10/2 = 5 \Rightarrow 10 = 2 \cdot 5$
$10/0 = x \Rightarrow 10 = 0 \cdot x = 0$

multiplicative inverse (or reciprocal)
(ex) the multiplicative inverse of 3 is $1/3$
(because $3 = \frac{3}{1}$ flip this over & you get $1/3$.)

Notice: dividing by a # is the same as multiplying by it's multiplicative inverse.

(ex) $12 \div 4 = 3$ and $12 \times \frac{1}{4} = \frac{12}{4} = 3$

Negative Signs & Parentheses

If you have a negative sign outside a parenthesis you must "distribute" the negative over.

ex $-(2x+3)$

$-(2x+3) = \boxed{-2x-3}$

ex $-(5x-8)$

$-(5x-8) = -5x--8$

$= \boxed{-5x+8}$

notice a shortcut: distributing a negative just changes all the signs!

ex $-3(2x-5)$

$-3(2x-5) = (-3)(2x)-(-3)(5)$

$= -6x--15$

$= \boxed{-6x+15}$

ex Simplify $-2(5x-8)-3(2x+4)$

$= -2(5x-8)-3(2x+4)$

$= -10x+16-6x-12$

$= \boxed{-16x+4}$