

OPERATION OF SIGNED NUMBERS

Numbers have a sign and a numeric value. For example, 5 has sign positive, "+", and numeric value "5" while -7 has sign negative, "-", and numeric value "7".

Basic Rules:

Multiplication/Division:

positive x positive = positive
negative x negative = positive
positive x negative = negative
negative x positive = negative

Examples:

$(+5) \times (+3) = +15$ $(+8)/(+2) = +4$
 $(-5) \times (-3) = +15$ $(-8)/(-2) = +4$
 $(+5) \times (-3) = -15$ $(+8)/(-2) = -4$
 $(-5) \times (+3) = -15$ $(-8)/(+2) = -4$

Note:

- any number multiplied by **ZERO** is **ZERO** $0 \times (-6) = 0$ $0 \times (6) = 0$
- any number divided by **ZERO** is undefined $7 \div 0 = \text{undefined}$
- ZERO** divided by any number ($\neq 0$) is **ZERO** $0 \div 7 = 0$
- ZERO** divided by **ZERO** is undefined. $0 \div 0 = \text{undefined}$

Addition/Subtraction

positive + positive = add, positive $(+4) + (+3) = +7$
negative + negative = add, negative $(-3) + (-2) = -5$
positive + negative = subtract, take sign of larger number $(+4) + (-3) = +1$
negative + positive = subtract, take sign of larger number $(-8) + (+2) = -6$

Note: Any addition/subtraction problem whether it involves "+" or "-" signs can be converted to an addition problem using the previous multiplication division rules with +1 and -1.

$a + b = (+a) + (+b)$ $a - (-b) = a + b = (+a) + (+b)$
 $-a - b = (-a) + (-b)$ $-(-a) + b = a + b = (+a) + (+b)$
 $-a + b = (-a) + (+b)$ $-(-a) - (-b) = a + b = (+a) + (+b)$
 $a - b = (+a) + (-b)$ $-(-a) - b = a - b = (+a) + (-b)$
 $-a - (-b) = -a + b = (-a) + (+b)$