Absolute Value

Absolute value describes the distance of a number line from 0 without considering which direction from the number lies. A whole number which is positive or negative is known as integers. They can be displayed on the number line while representing the number in the number line. The number in the right side of number line is always greater.

- 3> - 4, 0> - 10, -13< 1 etc

The distance of a number from a zero point is known as absolute values. For example:

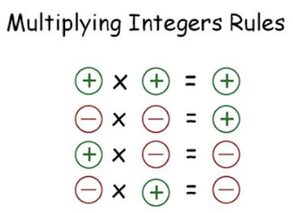
| -3 | = 3; | 4 | = 4, - | 3 | = -3 etc

In calculations on the absolute value of an integer can be considered as a positive integer. For example:

2 x |-6| = 2 x 6 =12

5 x |7| = 5 + 7 =12

Multiplication and division of two integers



Rules of signs

1. (+)*(+) = +
2. (-)*(-) = +
3. (+)*(-) = -
4. (-)*(+) = -
5. (+)÷(+)= +
6. (-)÷(-) = +
7. (+)÷(-) = -
8. (-)÷(+) = -

In case of dividing or multiplying two integers of a same sign then there is always positive and in case of two differents sign then the reasult sign is negative.

So, to multiply or divide two integers we multiply or divide their absolute value and then select a sign using the rule of signs.

Examples:

(i) -12×3

Multiply the absolute values:12×3=36, then signs are the opposite: -36

Thus, -12×3= -36

(ii) (-8)×(-6)

Multiply the absolute values: 8×6= 48

The signs are the same:48

Thus,(-8)×-6)=48

(iii)10×4

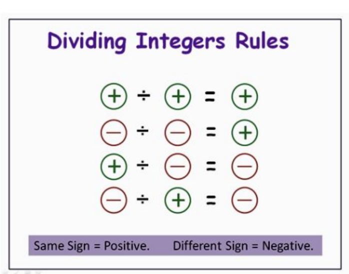
Multiply the absolute values: 10×4= 40

The signs are the same:40

Thus,10×4=40

(iv) $\frac{45}{-5}$

Divide the absolute values: $\frac{45}{-5}$ = 9



The signs are opposite: -9

Thus, $\frac{45}{-5}$ = -9

(v) $\frac{-18}{-6}$

Divide the absolute values: $\frac{18}{6}$ = 3

The signs are the same: 3

Thus, $\frac{-18}{-6}$ = 3

(vi) $\frac{-56}{7}$

Divide the absolute values: $\frac{-56}{7}$ = 8

The signs are the opposite: -8

Thus, $\frac{-56}{7}$ = -8

(vii) $\frac{32}{8}$

Divide the absolute values: $\frac{32}{8}$ = 4

The signs are the same: 4

Thus, $\frac{32}{8}$

= 4

Multiplication of several integers

Multiplying Integers Rules

+ × + = +
− × − = +
+ × − = −
− × + = −

(-2)(-4)(-3)= 8(-3)= -24

(-3)(-2)(-4)(-5)= 6×20= 120

While multiplying odd numbers of negative integers we multiply their values and select a negative sign(-) and while multiplying even numbers of negative integers we multiply their values and select a positive sign(+).

Following are the examples;

(i) (-2)(-5)(-2)

Multiply the absolute values: 2×5×2= 20

but(-2)(-5)(-2) = 20

(ii) (-6)(-2)(-1)(-2)

Multiply the absolute values: 6× 2× 1× 2 = 24

but, (-6)(-2)(-1)(-2)= -24

BODMAS Rule

According to BODMAS you must do brackets first, then division, then multiplication, then addition and subtraction. When doing addition and subtraction, it is best to go left to right.

BODMAS is a common type of rule used in simplification. It means things like add, subtract, multiply, divide, squaring etc.

B RACKETS ( ) [ ] { }

O RDER POWER OF $\sqrt{\ }$ $(\ )^2$

D IVIDE / ÷

M ULTIPLY * X

A DDITION +

S UBTRACTION —

Here,

BO refers to Bracket Open
{(3x4)} + {(5x7)}
3 x 4 + 5 x 7

D denotes Divide
$\frac{45}{-5}$
Divide the absolute values
$\frac{45}{-5}$ = -9
The signs are opposite = -9
Thus, $\frac{45}{-5}$ = -9

M refers to Multiply
15 x 4
Multiply the absolute values
15 x 4 =6

A refers to Addition
-5 + 15
Add the absolute values
-5 + 15 = 10
The sign is positive because we have to put the greater one.

S denotes Subtract
8 -3
Subtract the absolute values
8 - 3 = 5
The sign is of positive.

Integer

An integer is a number that can be written without a fractional component. For example, 21, 4, 0, and −2048 are integers, while 9.75, 5 1⁄2, and √2 are not.

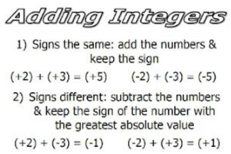
Addition of Integers

To add two integers with the same signs add their absolute values and select their common sign. For example,

1 + 2 =3, (-1) + (-2) = -3

To add two integers with the opposite signs, take a bigger absolute value, subtract a smaller absolute value and select a sign of bigger absolute. For example,

-3 + 5 = 2, 3 + (-5) = - 2



Subtraction of Integers

To subtract a positive integer means to add a negative integer. Instead of saying " Nine minus twelve" say "Nine minus Twelve" and then use the rule of adding integers with the opposite signs.

9 - 12 = 9 + (-12) = -3

Instead of saying " Negative six minus eight" say negative plus negative eight and then use the rule of adding integers with the same signs.

- 6 -8 = -6 + (-8) = -14

Look at the following example;

a) -8 -12

Translate to addition: (-8) + (-12)

Add two integers with the same signs: - 20

Thus, - 8 -12 = -20