How to Solve: Positive and Negative Numbers
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YouTube Video Link to this Post is [Here](#)

Following is Covered in this post
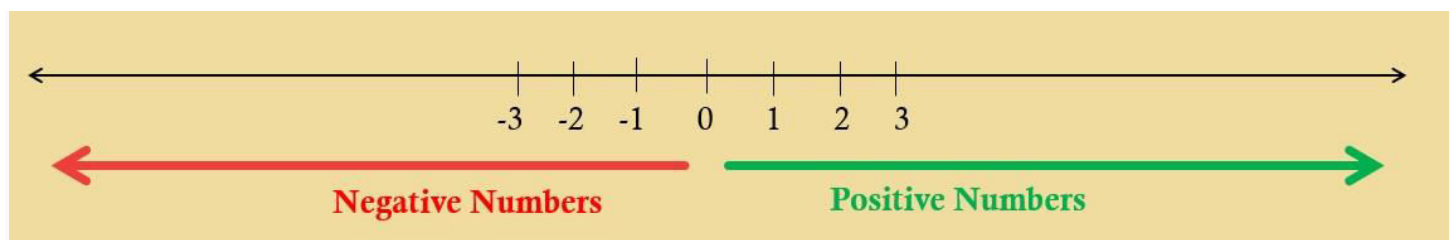
Following is Covered in the Video

- **Types of Numbers**
- **Zero**
- **Properties of Positive & Negative Numbers**
- **Solved Problems**

Types of Numbers

Three types of numbers are there in a number line
- Positive Number – All numbers to the right of 0 on the number line
- Negative Numbers – All numbers to the left of 0 on the number line
- Zero (neither +ve nor –ve)

Zero

- Zero is neither positive nor negative
- Zero is an even number
- For all x ≠ 0, $x^0 = 1$
- Division by zero is not defined

Properties of Positive and Negative Numbers

▪ **Addition**

(P is Positive and N is Negative)

P + P = P, Ex: 2 + 3 = 5
P + N = P or N or 0, Ex1: 3 + (-2) = 1, Ex2: 2 + (-3) = -1, Ex3: 3 + (-3) = 0
N + P = P or N or 0, Ex: Same as above
N + N = N, Ex: -2 + (-3) = = -5

▪ **Subtration**

P − P = P or N or 0, Ex1: 3 - 2 = 1, Ex2: 2 - 3 = -1, Ex3: 3 - 3 = 0
P − N = P, Ex: 3 - (-2) = 5
N − P = N, Ex: -3 - 2 = -5
N − N = P or N or 0, Ex1: -3 - (-4) = 1, Ex2: -3 - (-2) = -1, Ex3: -3 - (-3) = 0

▪ **Division**

P / P = P, Ex: 6/2 = 3
P / N = N, Ex: 6/-2 = -3
N / P = N, Ex: -6/2 = -3
N / N = P, Ex: -6/-2 = 3

▪ **Multiplication**

P * P = P, Ex: 2 * 3 = 6
P * N = N, Ex: 2 * -3 = -6
N * P = N, Ex: -2 * 3 = -6
N * N = P, Ex: -2 * -3 = 6

▪ **IF we are multiplying ODD number of Negative numbers then we will get a NEGATIVE number (Assuming they are not getting multiplied with zero)**

▪ **IF we are multiplying EVEN number of Negative numbers then we will get a POSITIVE number (Assuming they are not getting multiplied with zero)**

▫ If Product/Ratio of two numbers is positive, then both the numbers will have the SAME sign.

Example : xy > 0 or x/y > 0

=> x and y have the SAME sign

=> Either x > 0 and y > 0

Or x < 0 and y < 0

▫ If Product/Ratio of two numbers is negative, then both the numbers will have DIFFERENT signs.

Example : xy < 0 or x/y < 0

=> x and y have DIFFERENT signs

=> Either x > 0 and y < 0

Or x < 0 and y > 0

Solved Problems

Q1. Which of the following cannot be the value of x if y/(x-2) = 5 ?

A. 1

B. 2

C. 3

D. 4

E. 5

Sol: Denominator cannot be equal to 0

=> x - 2 ≠ 0

=> x ≠ 2

So, **Answer will be B**

Q2. Given that a and b are positive, and c and d are negative, which of the following will be positive for sure? (select all possible)

A. ab + cd

B. ab + acd

C. acd + bcd

D. abc + d

E. c + cd

Sol:

A. ab + cd = P*P + N*N = P + P = P = **TRUE**

B. ab + acd = P*P + P*N*N = P + P = P = **TRUE**

C. acd + bcd = P*N*N + P*N*N = P + P = P = **TRUE**

D. abc + d = P*P*N + N = N + N = N = **FALSE**
E. c + cd = N + N*N = N + P = N or P or 0 = **FALSE**

So, Answer will be A, B, C

Q3. Is bd>0 ?
A. ab > 0
B. cd > 0

Sol:
Stat A : ab > 0
There are two cases
a>0 and b>0
a<0 and b<0
In both the cases we don't know anything about the sign of d so **NOT sufficient**

Stat B: cd > 0
There are two cases
c>0 and d>0
c<0 and d<0
In both the cases we don't know anything about the sign of b so **NOT sufficient**

Combining both the statements we will have four cases
(1) a>0 b>0 c> 0 d>0
(2) a>0 b>0 c< 0 d<0
(3) a<0 b<0 c>0 d>0
(4) a<0 b<0 c<0 d<0

In case 1 and 4 bd > 0 and in case 2 and 3 bd < 0
So, Together also **NOT sufficient**.
So, **Answer will be E**

Q4. Is bd>0 ?
A. ab > 0
B. ad > 0

Sol:
Stat A : ab > 0
There are two cases
a>0 and b>0
a<0 and b<0
In both the cases we don't know anything about the sign of d so **NOT sufficient**

Stat B: ad > 0
There are two cases
a>0 and d>0
a<0 and d<0
In both the cases we don't know anything about the sign of b so **NOT sufficient**

Combining both the statements we will have two cases
(Since we have a common variable "a" in both the statements so we will combine the two statements based on the sign of the common variable)
First case of STAT A will be combined with the first case of Stat B and
Second case of STAT A will be combined with the second case of Stat B
(1) a>0 b>0 d>0   (2) a<0 b<0 d<0
In both the cases bd > 0

So, Together the two statements are **SUFFICIENT**.
So, **Answer will be C**

Hope it helps!