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THE SET OF INTEGERS ARE EQUAL TO ONE ANOTHER

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ABSTRACT: -

The integers are made up of positive numbers , negative numbers and zero .The positive numbers are the natural numbers . The integers are the real numbers .The real numbers are the rational and the irrational numbers . All integers are equal to one another .The complex numbers are made up of real numbers and imaginary numbers . The complex numbers are the sum of the imaginary numbers as well as the real numbers.

KEYWORDS: -

Positive number , Negative number, Zero, Equal , Square root

SUBJECT MATTER: -

All integers are equal to one another , So it is a paradox . Paradox is a statement, that seems to be absurd or contradictory , but it is true or it may be true .

Suppose X and Y are any two integers .

We have $(X - Y)^2 = X^2 + Y^2 - 2XY$ **----------(1)**

And $(Y - X)^2 = Y^2 + X^2 - 2YX$ **----------------(2)**

Here $-2XY = --2YX$, As Multiplication is commutative .

From the equation (1) and the equation (2)

It is obvious that $X^2 + Y^2 - 2XY = Y^2 + X^2 - 2YX$

As $-2XY = --2YX$

So $(X-Y)^2 = (Y-X)^2$ ---------------------(3)

The square root of a number x is a number $\pm y$ *such that* $y2 = x$

where $-y = \sqrt{x}$ *and* $+y = \sqrt{x}$

The square of a negative number is positive and the square of a positive number is also positive.

Taking the square root of both sides of the equation (3)

we get $\pm\sqrt{(X-Y)^2} = \pm\sqrt{(Y-X)^2}$

This implies that $-(X-Y) = -(Y-X)$ and

$+(X-Y) = +(Y-X)$ ------------- (4)

Taking the negative values of both sides of the equation (4)

we get $-(X - Y) = -(Y - X)$

=> $(X - Y) = (Y - X)$ By the Left cancellation law

So $X + X = Y + Y$ => $2X = 2Y$,

So **X = Y** , By the Left cancellation law

Taking the positive values of both sides of the equation (4) ,

We get $X - Y = Y - X$ => $X + X = Y + Y$

=> $2X = 2Y$

So **X = Y** By the Left cancellation law

Hence any two integers are equal to

each other .

CASE – I All positive numbers are equal to

one another

Show that $4 = 5$

Proof :- Let $X = 4$ and $Y = 5$

We have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

Putting the values of X and Y in the above equation ,

We get $\sqrt{(4-5)^2} = \sqrt{(5-4)^2}$

So $4 - 5 = 5 - 4$ => $4 + 4 = 5 + 5$

⇨ $8 = 10$ => $2 * 4 = 2 * 5$

⇨ $4 = 5$ By Left cancellation law

Hence all positive numbers are equal to one another .

CASE – II

Any positive number is equal to zero

Show that $3 = 0$

Proof :- Let $x = 3$ and $y = 0$

we have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

Putting the values of X and Y in the above equation

We get $\sqrt{(3-0)^2} = \sqrt{(0-3)^2}$

=> $3 - 0 = 0 - 3$ => $3 + 3 = 0 + 0$

=> $6 = 0$, => $2 * 3 = 2 * 0$

=> $3 = 0$ By Left cancellation law

Hence any positive number is equal to zero

CASE – III Any positive number and any

negative number are equal to each other

Show that $2 = -5$

Proof :- We have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

Let $x = 2$ and $y = -5$

Putting the values of X and Y in the above equation , *we get*

$$\sqrt{\left(2-(-5)\right)^2} = \sqrt{(-5-2)^2}$$

$2 + 5 = -5 - 2$ => $2 + 2 = -5 - 5$

=> $4 = -10$ => $2 * 2 = 2 * (-5)$

So $2 = -5$ By Left cancellation law

Hence any positive number and any negative number are equal to each other .

CASE – IV **All negative numbers are equal to one another**

Show that - 7 = - 9

Proof :- :-

We have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

Let X = - 7 and Y = - 9

Putting the values of X and Y in the above equation

We get $\sqrt{(-7-(-9))^2} = \sqrt{(-9-(-7))^2}$

=> - 7 – (- 9) = - 9 – (- 7)

=> - 7 + (- 7) = - 9 + (- 9)

=> - 7 – 7 = - 9 – 9

=> 2 *(- 7) = 2 * (- 9)

⇨ - 7 = - 9 By Left cancellation law

Hence all negative numbers are equal to one another

CASE -- V **Any negative number is equal to zero**

Show that - 8 = 0

Proof :-

We have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

Let X = - 8 and Y = 0

Putting the values of X and Y in the above equation

We have $\sqrt{(X-Y)^2} = \sqrt{(Y-X)^2}$

=> – 8 - 0 = 0 – (- 8)

=> - 8 - 0 = 0 + 8

=> - 8 – 8 = 0 + 0

=> 2 * (- 8) = 2 * (0) ,

Hence - 8 = 0 By Left cancellation law

Hence any negative number is equal to zero .

CONCLUSION :-

The above cases show that all integers are equal to one another .

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