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Period 3

Comparing Rational Numbers

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 02
CHAPTER NAME : RATIONAL NUMBERS

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Learning outcomes

Students will be

- To compare rational numbers and arrange it in ascending and descending order.

- To apply it in real life situations.

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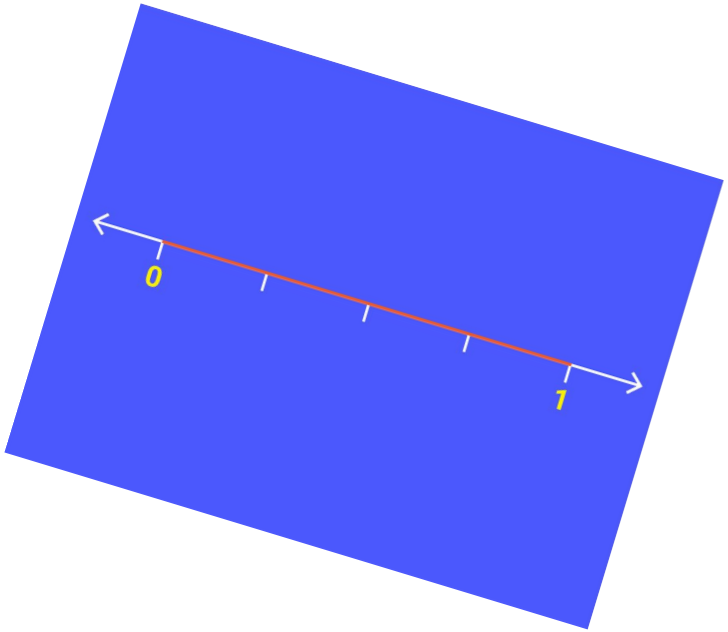
Video on

Representation of Rational Numbers on Number Line
1)https://www.youtube.com/watch?v=J-mrAZbOvQ8 (1;27)
2) https://www.youtube.com/watch?v=WynEmwOyMjE
(3:47 secs)

Are the numbers lying on the right are greater than numbers lying on the left ?



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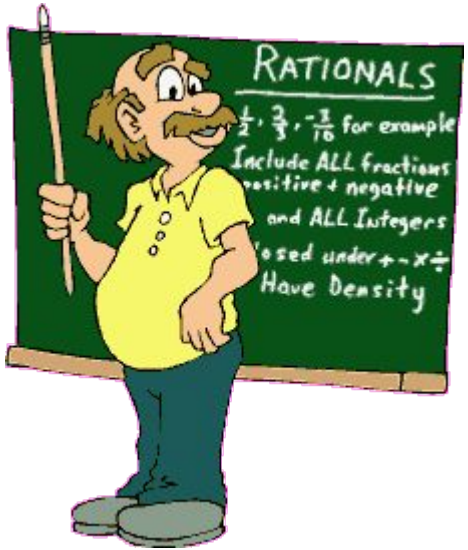
Video on comparison of rational numbers
https://www.youtube.com/watch?v=uyNO5m_F9Zw
(7:39seconds)



Comparison of rational numbers will be explained with the help of two methods

I First Method (LCM Method)

II Second Method (Cross Multiplication Method)

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LCM METHOD

1. To compare the **two positive rational numbers** we need to make their denominator same, then we can easily compare them.

2.CROSS MULTIPLICATION METHOD

In this method, to determine the equality of two rational numbers a/b and c/d, we use the following result:a× d and b × c

⇔ Numerator of first × Denominator of second > Denominator of first × Numerator of second

$$\frac{a}{b} > \frac{c}{d}$$

And vice –versa

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3. Compare:
(i) -1/4 and 0
(ii) 1/4 and 0
(iii) -3/8 and 2/5

Solution:

(i) -1/4 and 0

-1/4 is a negative rational number which is always less than 0.

Hence, $-1/4 < 0$.

(ii) 1/4 and 0

1/4 is a positive rational number which is always greater than 0.

Hence, $1/4 > 0$.

(iii) -3/8 and 2/5

We know that

a/b and c/d = a × d and b × c

So we get

$a \times d < b \times c$

Substituting the values

-3×5 and 2×8

$-15 < 16$

Hence, $-3/8 < 2/5$.

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iv) -5/8 and 7/-12
It can be written as
-5/ 8 and -7/12
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
– 5 × 12 and – 7 × 8
-60 < – 56
Hence, -5/8 < 7/-12.

(v) 5/-9 and -5/-9
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
5 × -9 and -5 × -9
– 45 < 45
Hence, 5/-9 < -5/-9.

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vi) -7/8 and 5/-6
It can be written as
-7/ 8 and -5/6
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
– 7 × 6 and -5 × 8
-42 < -40
Hence, -7/8 < 5/-6.

(vii) 2/7 and -3/-8
It can be written as
2/7 and 3/8
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
2 × 8 and 7 × 3
16 < 21

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4. Arrange the given rational numbers in ascending order:
(i) 7/10, -11/-30 and 5/-15
(ii) 4/-9, -5/12 and 2/-3

Solution:
(i) 7/10, -11/-30 and 5/-15
It is given that
= 7/10, -11/-30 and -5/-5
LCM of 10, 30 and 15 = 30
= (7 × 3)/ (10 × 3), 11/30 and (-5 × 2)/ (15 × 2)
So we get
= 21/30, 11/30 and -10/30
Here, -10 < 11 < 21
We can write it as
-10/ 30 < 11/30 < 21/30
By further calculation
5/ -15 < -11/ -30 < 7/10

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ii) 4/-9, -5/12 and 2/-3

It is given that

= -4/9, -5/12 and -2/3

LCM of 9, 12 and 3 is 36

= (-4 × 4)/ (9 × 4), (-5 × 3)/ (12 × 3) and (-2 × 12)/ (3 × 12)

So we get

= -16/36, -15/36 and -24/36

Here, -24 < -16 < -15

We can write it as

-24/36 < -16/36 < -15/36

By further calculation

2/ -3 < 4/ -9 < -5/12

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5. Arrange the given rational numbers in descending order:
(i) 5/8, 13/-16 and -7/12
(ii) 3/-10, -13/30 and 8/-20

Solution:
(i) 5/8, 13/-16 and -7/12
It can be written as
= 5/8, -13/16 and -7/12
LCM of 8, 16 and 12 is 48
= (5 × 6)/ (8 × 6), (-13 × 3)/ (16 × 3) and (-7 × 4)/ (12 × 4)
So we get
= 30/48, -39/48 and -28/48
Here, 30 > – 28 > – 39
We can write it as
30/48 > -28/48 > -39/48
By further calculation
5/8 > -7/12 > 13/-16

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ii) 3/-10, -13/30 and 8/-20
It can be written as
= -3/10, -13/30 and -8/20
LCM of 10, 20 and 30 is 60
= (- 3 × 6)/ (10 × 6), (-13 × 2)/ (30 × 2) and (-8 × 3)/ (20 × 3)
So we get
= -18/60, -26/60 and -24/60
Here, -18 > -24 > -26
We can write it as
-18/60 > -24/60 > -26/60
By further calculation
3/ -10 > 8/-20 > -13/30

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6. Fill in the blanks:

(i) 5/8 and 3/10 are on the ……. side of zero.

(ii) -5/8 and 3/10 are on the …….. sides of zero.

(iii) -5/8 and -3/10 are on the ……. side of zero.

(iv) 5/8 and -3/10 are on the …….. sides of zero

Solution:

(i) 5/8 and 3/10 are on the same side of zero.

(ii) -5/8 and 3/10 are on the opposite sides of zero.

(iii) -5/8 and -3/10 are on the same side of zero.

(iv) 5/8 and -3/10 are on the opposite sides of zero.

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HW

Exercise 2B Q.No. 2 and

AHA:Arrange the rational numbers in ascending order.

$$\frac{-7}{10}, \frac{5}{-8}, \frac{2}{-3}, \frac{-1}{4}, \frac{-3}{5}$$

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THANKING YOU

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