NCERT Solutions for Class 7 Maths Chapter 9: Physics Wallah experts have provided detailed solutions for NCERT Solutions for Class 7 Maths Chapter 9. This chapter is all about Rational Numbers, an important topic in math. These solutions are made simple and easy to understand. They show step-by-step how to do things like add, subtract, multiply, and divide rational numbers. They also explain how to represent these numbers on a number line and simplify fractions. With Physics Wallah help, students can understand rational numbers better and do well in their math studies.

NCERT Solutions for Class 7 Maths Chapter 9 PDF

You can find the PDF link for NCERT Solutions for Class 7 Maths Chapter 9 below. These solutions are designed to help you understand Rational Numbers better. They explain things step by step, making it easier for you to solve problems. By using this PDF, you can improve your skills in dealing with rational numbers and do well in your exams.

NCERT Solutions for Class 7 Maths Chapter 9 PDF

NCERT Solutions for Class 7 Maths Chapter 9 Rational Numbers

Exercise 9.1 Page: 182

1. List five rational numbers between:

(i) -1 and 0

Solution:-

The five rational numbers between -1 and 0 are,

-1< (-2/3) < (-3/4) < (-4/5) < (-5/6) < (-6/7) < 0

(ii) -2 and -1

Solution:-

The five rational numbers between -2 and -1 are,

-2 < (-8/7) < (-9/8) < (-10/9) < (-11/10) < (-12/11) < -1

(iii) -4/5 and -2/3

Solution:-

The five rational numbers between -4/5 and -2/3 are,

-4/5 < (-13/12) < (-14/13) < (-15/14) < (-16/15) < (-17/16) < -2/3

(iv) -1/2 and 2/3

Solution:-

The five rational numbers between -1/2 and 2/3 are,

-1/2 < (-1/6) < (0) < (1/3) < (1/2) < (20/36) < 2/3

2. Write four more rational numbers in each of the following patterns:

(i) -3/5, -6/10, -9/15, -12/20, …..

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 3 and 5.

= (-3 × 1)/ (5 × 1), (-3 × 2)/ (5 × 2), (-3 × 3)/ (5 × 3), (-3 × 4)/ (5 × 4)

Then, the next four rational numbers in this pattern are,

= (-3 × 5)/ (5 × 5), (-3 × 6)/ (5 × 6), (-3 × 7)/ (5 × 7), (-3 × 8)/ (5 × 8)

= -15/25, -18/30, -21/35, -24/40 ….

(ii) -1/4, -2/8, -3/12, …..

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 1 and 4.

= (-1 × 1)/ (4 × 1), (-1 × 2)/ (4 × 2), (-1 × 3)/ (1 × 3)

Then, the next four rational numbers in this pattern are,

= (-1 × 4)/ (4 × 4), (-1 × 5)/ (4 × 5), (-1 × 6)/ (4 × 6), (-1 × 7)/ (4 × 7)

= -4/16, -5/20, -6/24, -7/28 ….

(iii) -1/6, 2/-12, 3/-18, 4/-24 …..

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 1 and 6.

= (-1 × 1)/ (6 × 1), (1 × 2)/ (-6 × 2), (1 × 3)/ (-6 × 3), (1 × 4)/ (-6 × 4)

Then, the next four rational numbers in this pattern are,

= (1 × 5)/ (-6 × 5), (1 × 6)/ (-6 × 6), (1 × 7)/ (-6 × 7), (1 × 8)/ (-6 × 8)

= 5/-30, 6/-36, 7/-42, 8/-48 ….

(iv) -2/3, 2/-3, 4/-6, 6/-9 …..

Solution:-

In the above question, we can observe that the numerator and denominator are the multiples of 2 and 3.

= (-2 × 1)/ (3 × 1), (2 × 1)/ (-3 × 1), (2 × 2)/ (-3 × 2), (2 × 3)/ (-3 × 3)

Then, the next four rational numbers in this pattern are,

= (2 × 4)/ (-3 × 4), (2 × 5)/ (-3 × 5), (2 × 6)/ (-3 × 6), (2 × 7)/ (-3 × 7)

= 8/-12, 10/-15, 12/-18, 14/-21 ….

3. Give four rational numbers equivalent to:

(i) -2/7

Solution:-

The four rational numbers equivalent to -2/7 are,

= (-2 × 2)/ (7 × 2), (-2 × 3)/ (7 × 3), (-2 × 4)/ (7 × 4), (-2 × 5)/ (7× 5)

= -4/14, -6/21, -8/28, -10/35

(ii) 5/-3

Solution:-

The four rational numbers equivalent to 5/-3 are,

= (5 × 2)/ (-3 × 2), (5 × 3)/ (-3 × 3), (5 × 4)/ (-3 × 4), (5 × 5)/ (-3× 5)

= 10/-6, 15/-9, 20/-12, 25/-15

(iii) 4/9

Solution:-

The four rational numbers equivalent to 5/-3 are,

= (4 × 2)/ (9 × 2), (4 × 3)/ (9 × 3), (4 × 4)/ (9 × 4), (4 × 5)/ (9× 5)

= 8/18, 12/27, 16/36, 20/45

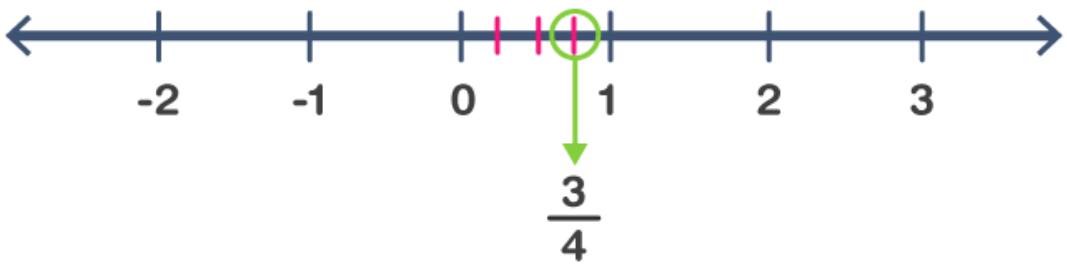
4. Draw the number line and represent the following rational numbers on it:

(i) ¾

Solution:-

We know that 3/4 is greater than 0 and less than 1.

∴ it lies between 0 and 1. It can be represented on the number line as,



(ii) -5/8

Solution:-

We know that -5/8 is less than 0 and greater than -1.

∴ it lies between 0 and -1. It can be represented on the number line as,

(iii) -7/4

Solution:-

Now, the above question can be written as,

= (-7/4) =
$-1\frac{3}{4}$

We know that (-7/4) is less than -1 and greater than -2.

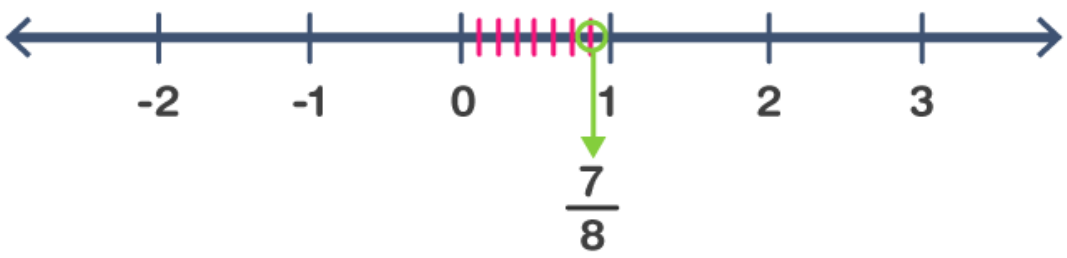
∴ it lies between -1 and -2. It can be represented on the number line as,

(iv) 7/8

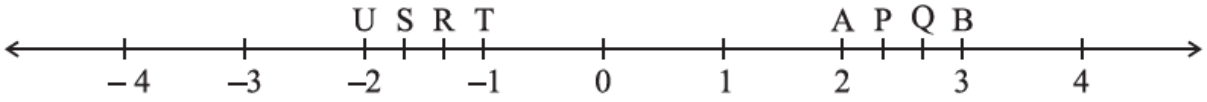
Solution:-

We know that 7/8 is greater than 0 and less than 1.

∴ it lies between 0 and 1. It can be represented on the number line as,



5. The points P, Q, R, S, T, U, A and B on the number line are such that, TR = RS = SU and AP = PQ = QB. Name the rational numbers represented by P, Q, R and S.



Solution:-

By observing the figure, we can say that,

The distance between A and B = 1 unit

And it is divided into 3 equal parts = AP = PQ = QB = 1/3

P = 2 + (1/3)

= (6 + 1)/ 3

= 7/3

Q = 2 + (2/3)

= (6 + 2)/ 3

= 8/3

Similarly,

The distance between U and T = 1 unit

And it is divided into 3 equal parts = TR = RS = SU = 1/3

R = – 1 – (1/3)

= (- 3 – 1)/ 3

= – 4/3

S = – 1 – (2/3)

= – 3 – 2)/ 3

= – 5/3

6. Which of the following pairs represents the same rational number?

(i) (-7/21) and (3/9)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

-7/21 = 3/9

-1/3 = 1/3

∵ -1/3 ≠ 1/3

∴ -7/21 ≠ 3/9

So, the given pair does not represent the same rational number**.**

(ii) (-16/20) and (20/-25)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

-16/20 = 20/-25

-4/5 = 4/-5

∵ -4/5 = -4/5

∴ -16/20 = 20/-25

So, the given pair represents the same rational number.

(iii) (-2/-3) and (2/3)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

-2/-3 = 2/3

2/3= 2/3

∵ 2/3 = 2/3

∴ -2/-3 = 2/3

So, the given pair represents the same rational number.

(iv) (-3/5) and (-12/20)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

-3/5 = – 12/20

-3/5 = -3/5

∵ -3/5 = -3/5

∴ -3/5= -12/20

So, the given pair represents the same rational number.

(v) (8/-5) and (-24/15)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

8/-5 = -24/15

8/-5 = -8/5

∵ -8/5 = -8/5

∴ 8/-5 = -24/15

So, the given pair represents the same rational number.

(vi) (1/3) and (-1/9)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

1/3 = -1/9

∵ 1/3 ≠ -1/9

∴ 1/3 ≠ -1/9

So, the given pair does not represent the same rational number.

(vii) (-5/-9) and (5/-9)

Solution:-

We have to check if the given pair represents the same rational number**.**

Then,

-5/-9 = 5/-9

∵ 5/9 ≠ -5/9

∴ -5/-9 ≠ 5/-9

So, the given pair does not represent the same rational number.

7. Rewrite the following rational numbers in the simplest form:

(i) -8/6

Solution:-

The given rational numbers can be simplified further,

Then,

= -4/3 … [∵ Divide both numerator and denominator by 2]

(ii) 25/45

Solution:-

The given rational numbers can be simplified further,

Then,

= 5/9 … [∵ Divide both numerator and denominator by 5]

(iii) -44/72

Solution:-

The given rational numbers can be simplified further,

Then,

= -11/18 … [∵ Divide both numerator and denominator by 4]

(iv) -8/10

Solution:-

The given rational numbers can be simplified further,

Then,

= -4/5 … [∵ Divide both numerator and denominator by 2]

8. Fill in the boxes with the correct symbol out of >, <, and =.

(i) -5/7 [ ] 2/3

Solution:-

The LCM of the denominators 7 and 3 is 21

∴ (-5/7) = [(-5 × 3)/ (7 × 3)] = (-15/21)

And (2/3) = [(2 × 7)/ (3 × 7)] = (14/21)

Now,

-15 < 14

So, (-15/21) < (14/21)

Hence, -5/7 [<] 2/3

(ii) -4/5 [ ] -5/7

Solution:-

The LCM of the denominators 5 and 7 is 35

∴ (-4/5) = [(-4 × 7)/ (5 × 7)] = (-28/35)

And (-5/7) = [(-5 × 5)/ (7 × 5)] = (-25/35)

Now,

-28 < -25

So, (-28/35) < (- 25/35)

Hence, -4/5 [<] -5/7

(iii) -7/8 [ ] 14/-16

Solution:-

14/-16 can be simplified further,

Then,

7/-8 … [∵ Divide both numerator and denominator by 2]

So, (-7/8) = (-7/8)

Hence, -7/8 [=] 14/-16

(iv) -8/5 [ ] -7/4

Solution:-

The LCM of the denominators 5 and 4 is 20

∴ (-8/5) = [(-8 × 4)/ (5 × 4)] = (-32/20)

And (-7/4) = [(-7 × 5)/ (4 × 5)] = (-35/20)

Now,

-32 > – 35

So, (-32/20) > (- 35/20)

Hence, -8/5 [>] -7/4

(v) 1/-3 [ ] -1/4

Solution:-

The LCM of the denominators 3 and 4 is 12

∴ (-1/3) = [(-1 × 4)/ (3 × 4)] = (-4/12)

And (-1/4) = [(-1 × 3)/ (4 × 3)] = (-3/12)

Now,

-4 < – 3

So, (-4/12) < (- 3/12)

Hence, 1/-3 [<] -1/4

(vi) 5/-11 [ ] -5/11

Solution:-

Since, (-5/11) = (-5/11)

Hence, 5/-11 [=] -5/11

(vii) 0 [ ] -7/6

Solution:-

Since every negative rational number is less than 0,

We get:

= 0 [>] -7/6

9. Which is greater in each of the following:

(i) 2/3, 5/2

Solution:-

The LCM of the denominators 3 and 2 is 6

(2/3) = [(2 × 2)/ (3 × 2)] = (4/6)

And (5/2) = [(5 × 3)/ (2 × 3)] = (15/6)

Now,

4 < 15

So, (4/6) < (15/6)

∴ 2/3 < 5/2

Hence, 5/2 is greater.

(ii) -5/6, -4/3

Solution:-

The LCM of the denominators 6 and 3 is 6

∴ (-5/6) = [(-5 × 1)/ (6 × 1)] = (-5/6)

And (-4/3) = [(-4 × 2)/ (3 × 2)] = (-12/6)

Now,

-5 > -12

So, (-5/6) > (- 12/6)

∴ -5/6 > -12/6

Hence, – 5/6 is greater.

(iii) -3/4, 2/-3

Solution:-

The LCM of the denominators 4 and 3 is 12

∴ (-3/4) = [(-3 × 3)/ (4 × 3)] = (-9/12)

And (-2/3) = [(-2 × 4)/ (3 × 4)] = (-8/12)

Now,

-9 < -8

So, (-9/12) < (- 8/12)

∴ -3/4 < 2/-3

Hence, 2/-3 is greater.

(iv) -¼, ¼

Solution:-

The given fraction is like friction,

So, -¼ < ¼

Hence ¼ is greater,

(v)
$-3\frac{2}{7}$,
$-3\frac{4}{5}$

Solution:-

First, we have to convert mixed fractions into improper fractions,

$-3\frac{2}{7}$ = -23/7

$-3\frac{4}{5}$ = -19/5

Then,

The LCM of the denominators 7 and 5 is 35

∴ (-23/7) = [(-23 × 5)/ (7 × 5)] = (-115/35)

And (-19/5) = [(-19 × 7)/ (5 × 7)] = (-133/35)

Now,

-115 > -133

So, (-115/35) > (- 133/35)

∴
$-3\frac{2}{7} > -3\frac{4}{5}$

Hence,

$-3\frac{2}{7}$ is greater.

10. Write the following rational numbers in ascending order:

(i) -3/5, -2/5, -1/5

Solution:-

The given rational numbers are in the form of like fractions,

Hence,

(-3/5)< (-2/5) < (-1/5)

(ii) -1/3, -2/9, -4/3

Solution:-

To convert the given rational numbers into like fractions, we have to find the LCM,

The LCM of 3, 9, and 3 is 9

Now,

(-1/3)= [(-1 × 3)/ (3 × 9)] = (-3/9)

(-2/9)= [(-2 × 1)/ (9 × 1)] = (-2/9)

(-4/3)= [(-4 × 3)/ (3 × 3)] = (-12/9)

Clearly,

(-12/9) < (-3/9) < (-2/9)

Hence,

(-4/3) < (-1/3) < (-2/9)

(iii) -3/7, -3/2, -3/4

Solution:-

To convert the given rational numbers into like fractions, we have to find LCM,

The LCM of 7, 2, and 4 is 28

Now,

(-3/7)= [(-3 × 4)/ (7 × 4)] = (-12/28)

(-3/2)= [(-3 × 14)/ (2 × 14)] = (-42/28)

(-3/4)= [(-3 × 7)/ (4 × 7)] = (-21/28)

Clearly,

(-42/28) < (-21/28) < (-12/28)

Hence,

(-3/2) < (-3/4) < (-3/7)