

**EXERCISE 2B**

1. Mark the following pairs of rational numbers on the separate number lines:

(i)  $\frac{3}{4}$  and  $-\frac{1}{4}$

(ii)  $\frac{2}{5}$  and  $-\frac{3}{5}$

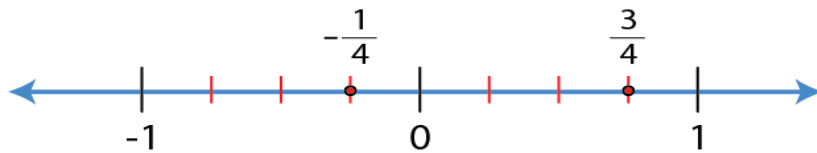
(iii)  $\frac{5}{6}$  and  $-\frac{2}{3}$

(iv)  $\frac{2}{5}$  and  $-\frac{4}{5}$

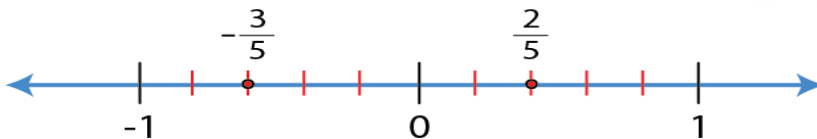
(v)  $\frac{1}{4}$  and  $-\frac{5}{4}$

**Solution:**

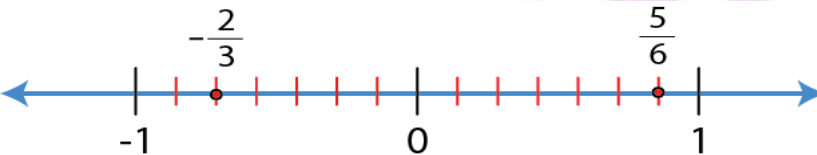
(i)  $\frac{3}{4}$  and  $-\frac{1}{4}$



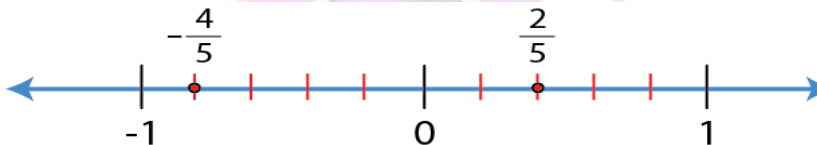
(ii)  $\frac{2}{5}$  and  $-\frac{3}{5}$



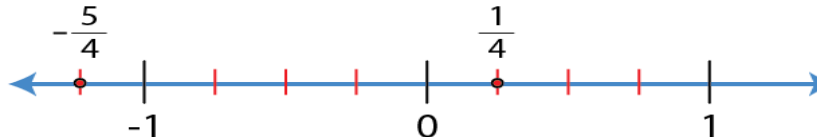
(iii)  $\frac{5}{6}$  and  $-\frac{2}{3}$



(iv)  $\frac{2}{5}$  and  $-\frac{4}{5}$



(v)  $\frac{1}{4}$  and  $-\frac{5}{4}$



2. Compare:

(i)  $\frac{3}{5}$  and  $\frac{5}{7}$

(ii)  $-\frac{7}{2}$  and  $\frac{5}{2}$

(iii)  $-3$  and  $2\frac{3}{4}$

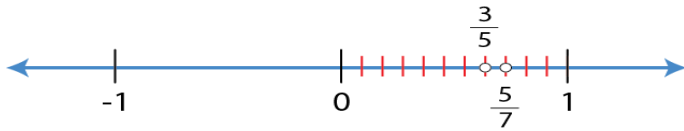
(iv)  $-1\frac{1}{2}$  and  $0$

(v)  $0$  and  $\frac{3}{4}$

(vi)  $3$  and  $-1$

**Solution:**

(i)  $3/5$  and  $5/7$



$5/7$  is on the right side of the number line.  
Hence,  $3/5 < 5/7$ .

(ii)  $-7/2$  and  $5/2$



P is on the right of Q  
Hence,  $-7/2 < 5/2$ .

(iii)  $-3$  and  $2\frac{3}{4}$



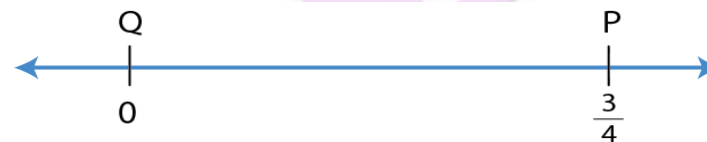
P is on the right of Q  
Hence,  $-3 < 11/4$  or  $-3 < 2\frac{3}{4}$ .

(iv)  $-1\frac{1}{2}$  and 0



P is on the right of Q  
Hence,  $-3/2 < 0$  or  $-1\frac{1}{2} < 0$ .

(v) 0 and  $3/4$



P is on the right of Q  
Hence,  $0 < 3/4$ .

(vi) 3 and -1



P is on the right of Q  
Hence,  $3 > -1$ .

**3. Compare:**

(i)  $-1/4$  and 0

(ii)  $1/4$  and  $0$

(iii)  $-3/8$  and  $2/5$

(iv)  $-5/8$  and  $7/-12$

(v)  $5/-9$  and  $-5/-9$

(vi)  $-7/8$  and  $5/-6$

(vii)  $2/7$  and  $-3/-8$

**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  $c/d = a \times d$  and  $b \times c$

So we get

$a \times d < b \times c$

Substituting the values

$-3 \times 5$  and  $2 \times 8$

$-15 < 16$

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

(iv)  $-5/8$  and  $7/-12$

It can be written as

$-5/8$  and  $-7/12$

We know that

$a/b$  and  $c/d = a \times d$  and  $b \times c$

So we get

$a \times d < b \times c$

Substituting the values

$-5 \times 12$  and  $-7 \times 8$

$-60 < -56$

Hence,  $-5/8 < 7/-12$ .

(v)  $5/-9$  and  $-5/-9$

We know that

$a/b$  and  $c/d = a \times d$  and  $b \times c$

So we get

$a \times d < b \times c$

Substituting the values

$5 \times -9$  and  $-5 \times -9$

$-45 < 45$

Hence,  $5/-9 < -5/-9$ .

(vi)  $-7/8$  and  $5/-6$

It can be written as

$-7/8$  and  $-5/6$

We know that

$$a/b \text{ and } c/d = a \times d \text{ and } b \times c$$

So we get

$$a \times d < b \times c$$

Substituting the values

$$-7 \times 6 \text{ and } -5 \times 8$$

$$-42 < -40$$

Hence,  $-7/8 < 5/6$ .

(vii)  $2/7$  and  $-3/8$

It can be written as

$2/7$  and  $3/8$

We know that

$$a/b \text{ and } c/d = a \times d \text{ and } b \times c$$

So we get

$$a \times d < b \times c$$

Substituting the values

$$2 \times 8 \text{ and } 7 \times 3$$

$$16 < 21$$

Hence,  $2/7 < -3/8$ .

**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

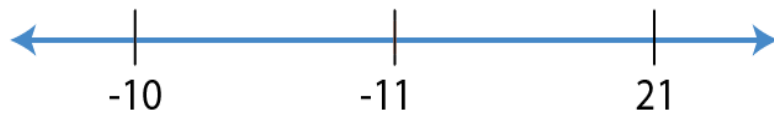
$$= 7/10, -11/30 \text{ and } -5/5$$

$$\text{LCM of } 10, 30 \text{ and } 15 = 30$$

$$= (7 \times 3)/(10 \times 3), 11/30 \text{ and } (-5 \times 2)/(15 \times 2)$$

So we get

$$= 21/30, 11/30 \text{ and } -10/30$$



Here,  $-10 < 11 < 21$

We can write it as

$$-10/30 < 11/30 < 21/30$$

By further calculation

$$5/15 < -11/30 < 7/10$$

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

It is given that

$$= 4/9, -5/12 \text{ and } -2/3$$

$$\text{LCM of } 9, 12 \text{ and } 3 \text{ is } 36$$

$$= (-4 \times 4)/(9 \times 4), (-5 \times 3)/(12 \times 3) \text{ and } (-2 \times 12)/(3 \times 12)$$

So we get

$$= -16/36, -15/36 \text{ and } -24/36$$



Here,  $-24 < -16 < -15$

We can write it as

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

By further calculation

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

**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

$$= 5/8, -13/16 \text{ and } -7/12$$

LCM of 8, 16 and 12 is 48

$$= (5 \times 6)/(8 \times 6), (-13 \times 3)/(16 \times 3) \text{ and } (-7 \times 4)/(12 \times 4)$$

So we get

$$= 30/48, -39/48 \text{ and } -28/48$$



Here,  $30 > -28 > -39$

We can write it as

$$30/48 > -28/48 > -39/48$$

By further calculation

$$5/8 > -7/12 > 13/-16$$

(ii)  $3/-10$ ,  $-13/30$  and  $8/-20$

It can be written as

$$= -3/10, -13/30 \text{ and } -8/20$$

LCM of 10, 20 and 30 is 60

$$= (-3 \times 6)/(10 \times 6), (-13 \times 2)/(30 \times 2) \text{ and } (-8 \times 3)/(20 \times 3)$$

So we get

$$= -18/60, -26/60 \text{ and } -24/60$$



Here,  $-18 > -24 > -26$

We can write it as

$$-18/60 > -24/60 > -26/60$$

By further calculation

$$3/-10 > 8/-20 > -13/30$$

**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.

