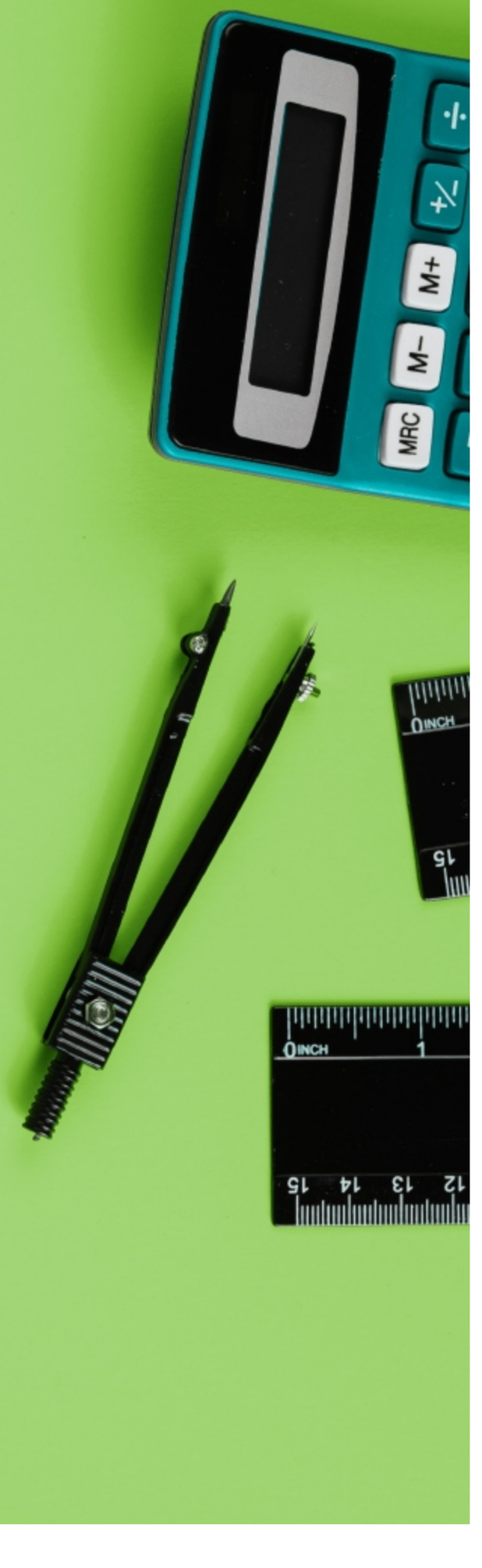
RD Sharma Solutions

Class 7

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Exercise 4.6

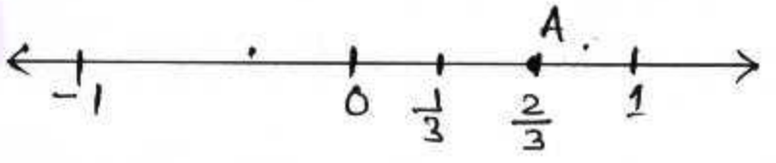
Q.1 Draw the number line and represent the following rational numbers on it.

(i) $\frac{2}{3}$ (ii) $\frac{3}{4}$ (iii) $\frac{3}{8}$ (iv) $\frac{-5}{8}$

(v) $\frac{-3}{16}$ (vi) $\frac{-7}{3}$ (vii) $\frac{22}{-7}$ (viii) $\frac{-31}{3}$

Solution: (i) In order to represent $\frac{2}{3}$ on number line, first we draw a line and Mark a point 0 to represent zero.

Now $\because \frac{2}{3} < 1$, It will lie between 0 and 1. So we divide the gap between 0 and 1 in three equal parts.

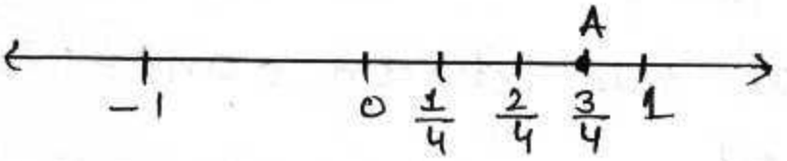


Here, point A represents $\frac{2}{3}$.

(ii) For represent $\frac{3}{4}$, $\because \frac{3}{4} < 1$, it will lies between 0 and 1.

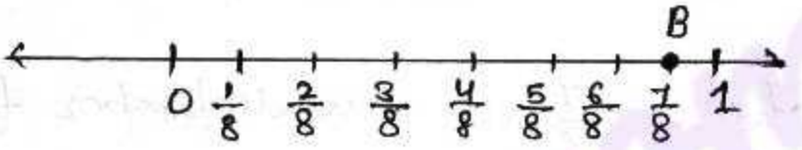
We divide the gap between 0 and 1 in four equal parts.

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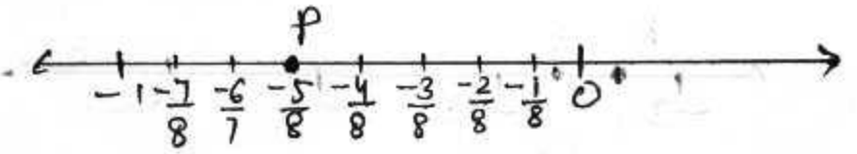
Point A represents $\frac{3}{4}$.

(iii) $\because \frac{3}{8} < 1$, we divide the gap between 0 and 1 in 8 equal parts.



here, point B represents $\frac{7}{8}$ on number line

(iv) $\frac{-5}{8}$, $\because \frac{-5}{8}$ is a negative rational number. so it lies between 0 and -1. we divide the gap between 0 and -1 in 8 equal parts.

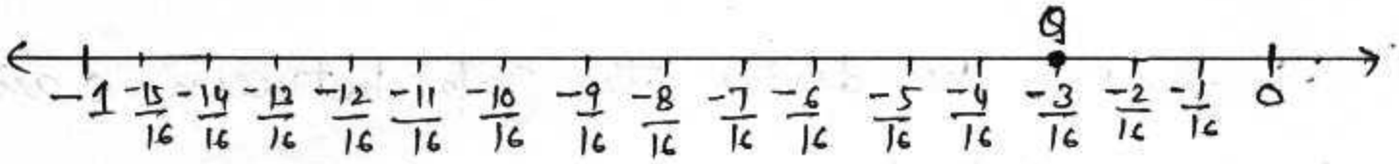


here, Point P represents $\frac{-5}{8}$.

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(v) $-\frac{3}{16}$, $-\frac{3}{16}$ lies between 0 and -1, we divide the gap between 0 and -1 in 16 equal parts, we get.



here, point Q, represents $-\frac{3}{16}$.

(vi) $-\frac{7}{3}$, here $-\frac{7}{3}$ is an improper fraction. First we convert $-\frac{7}{3}$ into mixed fraction

$$-\frac{7}{3} = -2\frac{1}{3} = -2+\frac{1}{3}$$

$\therefore$ $-\frac{7}{3}$ lies between -2 and -3. we divide the gap between -2 and -3 in three equal parts.

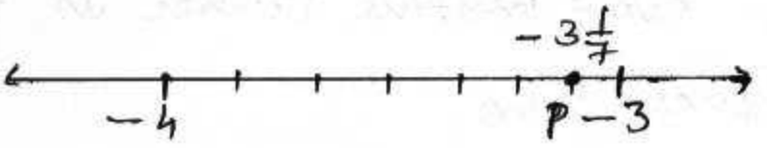


here, point S represents $-2\frac{1}{3}$ i.e $-\frac{7}{3}$.

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(vii) $\frac{22}{-7} = \frac{+22}{-7} \times \frac{-1}{-1} = \frac{-22}{7} = -3\frac{1}{7}$

here it lies between -3 and -4. divide the gap between -3 and -4 in 7 equal parts.



here, point P represents $-3\frac{1}{7} = \frac{-22}{7}$

(viii) $\frac{-31}{3} = -10\frac{1}{3}$

here, it lies between -10 and -11. divide the gap between -10 and -11 in three equal parts, we get



here, A Represents $-10\frac{1}{3}$ i.e $\frac{-31}{3}$

8.2 Which of the following two rational numbers in each of the following pairs of rational number is greater?

(i) $\frac{-3}{8}, 0$ (ii) $\frac{5}{2}, 0$ (iii) $\frac{-4}{11}, \frac{3}{11}$ (iv) $\frac{-7}{12}, \frac{5}{-8}$

(v) $\frac{4}{-9}, \frac{-3}{-7}$ (vi) $\frac{-5}{8}, \frac{3}{-4}$ (vii) $\frac{5}{9}, \frac{-3}{-8}$ (viii) $\frac{5}{-8}, \frac{-7}{12}$

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Solution: (i) $\frac{-3}{8}, 0$, here $\because$ 0 is greater than every negative number.

$\therefore$ 0 is greater than $-\frac{3}{8}$

(ii) $\frac{5}{2}, 0$, $\because$ every positive number is greater than 0.

hence $\frac{5}{2} > 0$

(iii) $\frac{-4}{11}, \frac{3}{11}$, here $\because 3 > -4$

Therefore $\frac{3}{11} > \frac{-4}{11}$

(iv) $\frac{-7}{12}, \frac{5}{-8}$, here first we write $\frac{5}{-8}$ with positive denominator, so $\frac{5}{-8} \times \frac{-1}{-1} = \frac{-5}{8}$

Now for compare $\frac{-7}{12}, \frac{-5}{8}$, we convert these with same denominator equals to LCM (12,8) = 24

here $\frac{-7 \times 2}{12 \times 2} = \frac{-14}{24}$; $\frac{-5}{8} \times \frac{3}{3} = \frac{-15}{24}$

$\because -14 > -15$

$\Rightarrow \frac{-7}{12} > \frac{-5}{8}$

(v) $\frac{4}{-9}, \frac{-3}{7}$

here, first we make $\frac{4}{-9}$ with positive denominator.

$\frac{4}{-9} \times \frac{-1}{-1} = \frac{-4}{9}$

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Now $-\frac{4}{9}$ and $\frac{-3}{7}$,

$\because$ LCM (9,7) = 63,

we convert both rational numbers with common denominator equals to 63., we get

$-\frac{4}{9} \times \frac{7}{7} = \frac{-28}{63}$; $\frac{-3}{7} \times \frac{9}{9} = \frac{-27}{63}$

here $-27 > -28$

$\Rightarrow \quad \frac{-3}{7} > \frac{-4}{9}$

(VI) $\frac{-5}{8}, \frac{3}{-4}$, here, first we convert $\frac{3}{-4}$ with positive denominator, we get $\frac{3}{-4} \times \frac{-1}{-1} = \frac{-3}{4}$

To compare $\frac{-5}{8}$ and $\frac{-3}{4}$, we convert them with same denominator equals to LCM (8,4) = 8

$\frac{-5 \times 1}{8 \times 1} = \frac{-5}{8}$; $\frac{-3}{4} \times \frac{2}{2} = \frac{-6}{8}$

$\because -5 > -6$

$\Rightarrow \frac{-5}{8} > \frac{-3}{4}$

(VII) $\frac{5}{9}, \frac{-3}{-8}$

here $\frac{-3}{-8} \times \frac{-1}{-1} = \frac{3}{8}$

Now LCM (9,8) = 72

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By making their denominator same, we get

$\frac{5}{9} \times \frac{8}{8} = \frac{40}{72}$; $\frac{3}{8} \times \frac{9}{9} = \frac{27}{72}$

$\because 40 > 27$

$\Rightarrow \frac{5}{9} > \frac{3}{8}$

(viii) $\frac{5}{-8}, \frac{-7}{12}$

Here, $\frac{5}{-8} \times \frac{-1}{-1} = \frac{-5}{8}$

To compare $\frac{-5}{8}$ and $\frac{-7}{12}$, convert them with same denominators equals to LCM(8, 12) = 24, we get

$\frac{-5 \times 3}{8 \times 3} = \frac{-15}{24}$; $\frac{-7}{12} \times \frac{2}{2} = \frac{-14}{24}$

$\because -14 > -15$

$\Rightarrow \frac{-7}{12} > \frac{-5}{8}$

Q.3 Which of the two rational numbers in each of the following pairs of rational numbers smaller?

(i) $\frac{-6}{-13}, \frac{7}{13}$ (ii) $\frac{16}{-5}, 3$ (iii) $-\frac{4}{3}, \frac{8}{-7}$

(iv) $\frac{-12}{5}, -3$

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Solution (i) $\frac{-6}{-13}, \frac{7}{13}$

here $\frac{-6}{-13} \times \frac{-1}{-1} = \frac{6}{13}$

Now to compare $\frac{6}{13}, \frac{7}{13}$

$\because 6 < 7$

$\Rightarrow \frac{-6}{-13} < \frac{7}{13}$

(ii) $\frac{16}{-5}, 3$

first, we convert $\frac{16}{-5}$ with positive denominator $\frac{16}{-5} \times \frac{-1}{-1} = -\frac{16}{5}$

$\because$ every negative number is smaller than positive number, then

$\frac{16}{-5} < 3$

(iii) $-\frac{4}{3}, \frac{8}{-7}$, we convert $\frac{8}{-7}$ with positive denominator

$\frac{8}{-7} \times \frac{-1}{-1} = \frac{-8}{7}$

Now to compare $-\frac{4}{3}, -\frac{8}{7}$, we make their denominator same equal to LCM $(3,7) = 21$

$-\frac{4}{3} \times \frac{7}{7} = -\frac{28}{21}$; $-\frac{8}{7} \times \frac{3}{3} = -\frac{24}{21}$

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$\because -28 < -24$

$\Rightarrow \frac{-4}{3} < \frac{8}{-7}$

(IV) $\frac{-12}{5}, \frac{-3}{1}$

here LCM(5,1) = 5

Therefor $-\frac{3}{1} \times \frac{5}{5} = \frac{-15}{5}$

$\because -15 < -12$

$\Rightarrow -3 < \frac{-12}{5}$

Q.4 Fill in the blanks by the correct symbol >=, or <

(I) $\frac{-6}{7} \ldots \frac{7}{13}$ (II) $\frac{-3}{5} \ldots \frac{-5}{6}$

(III) $\frac{-2}{3} \ldots \frac{5}{-8}$ (IV) $0 \ldots \frac{-2}{5}$

Solution: (I) $\frac{-6}{7}$ and $\frac{7}{13}$, By making their denominator same equal to LCM (7,13) = 91

$\frac{-6}{7} \times \frac{13}{13} = \frac{-78}{91}$; $\frac{7}{13} \times \frac{7}{7} = \frac{49}{91}$

$\because 49 > -78$

$\therefore \frac{-6}{7} < \frac{7}{13}$

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(ii) $-\frac{3}{5} \ldots -\frac{5}{6}$

By Cross Multiplication.

$-3 \times 6 > -5 \times 5$

$-18 > -25$

$\therefore -\frac{3}{5} > \frac{-5}{6}$

(iii) $-\frac{2}{3} \ldots \frac{5}{-8}$

By Cross Multiplication, we get

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

$\Rightarrow 16 > 15$

$\therefore -\frac{2}{3} > \frac{5}{-8}$

(iv) $0 > -\frac{2}{5}$, as 0 is greater than every negative integer.

Q5 Arrange the following rational numbers in ascending order:

(i) $\frac{3}{5}, \frac{-17}{-30}, \frac{8}{-15}, \frac{-7}{10}$ (ii) $\frac{-4}{9}, \frac{5}{-12}, \frac{7}{-18}, \frac{2}{-3}$

Solution (i) $\frac{3}{5}, \frac{-17}{-30}, \frac{8}{-15}, \frac{-7}{10}$

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first we make all rational number with positive denominator, we get

$$\frac{3}{5}, \frac{17}{30}, \frac{-8}{15}, \frac{-7}{10}$$

$\because$ LCM $(5, 30, 15, 10) = 30$

$$\frac{3}{5}\times\frac{6}{6} = \frac{18}{30} \; ; \; \frac{17}{30}\times\frac{1}{1} = \frac{17}{30} \; ; \; \frac{-8}{15}\times\frac{2}{2} = \frac{-16}{30}$$

$$\frac{-7}{10}\times\frac{3}{3} = \frac{-21}{30}$$

$\because \quad -21 < -16 < 17 < 18$

$$\Rightarrow \quad \frac{-7}{10} < \frac{-8}{15} < \frac{17}{30} < \frac{3}{5}$$

(11) $\frac{-4}{9}, \frac{5}{-12}, \frac{7}{-18}, \frac{2}{-3}$

First we make all rational numbers with positive denominator, we get

$$\frac{-4}{9}, \frac{-5}{12}, \frac{-7}{18}, \frac{-2}{3}$$

$\because$ LCM $(9, 12, 18, 3) = 36$

$$\frac{-4}{9}\times\frac{4}{4} = \frac{-16}{36} \; ; \; \frac{-5}{12}\times\frac{3}{3} = \frac{-15}{36} \; ; \; \frac{-7}{18}\times\frac{2}{2} = \frac{-14}{36}$$

$$\frac{-2}{3}\times\frac{12}{12} = \frac{-24}{36} \; ,$$

$\because \quad -24 < -16 < -15 < -14$

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$\Rightarrow \quad -\frac{2}{3} < -\frac{4}{9} < \frac{-5}{12} < \frac{-7}{18}$

Q6 Arrange the following rational numbers in descending order.

(i) $\frac{7}{8}, \frac{64}{16}, \frac{36}{-12}, \frac{5}{-4}, \frac{140}{28}$ (ii) $\frac{-3}{10}, \frac{17}{-30}, \frac{7}{-15}, \frac{-11}{20}$

Solution: (i) $\frac{7}{8}, \frac{64}{16}, \frac{36}{-12}, \frac{5}{-4}, \frac{140}{28}$

By Making positive denominator, we get

$\frac{7}{8}, \frac{64}{16}, \frac{-36}{12}, \frac{-5}{4}, \frac{140}{28}$

Now LCM $(8, 16, 12, 4, 28) = 336$.

$\frac{7}{8} \times \frac{42}{42} = \frac{294}{336}$; $\frac{64}{16} \times \frac{21}{21} = \frac{1344}{336}$

$-\frac{36}{12} \times \frac{28}{28} = -\frac{1008}{336}$, $\frac{-5}{4} \times \frac{84}{84} = \frac{-420}{336}$; $\frac{140}{28} \times \frac{12}{12} = \frac{1680}{336}$

$\therefore 1680 > 1344 > 294 > -420 > -1008$

$= \quad \frac{140}{28} > \frac{64}{16} > \frac{7}{8} > \frac{-5}{4} > \frac{-36}{12}$

(ii) $\frac{-3}{10}, \frac{17}{-30}, \frac{7}{-15}, \frac{-11}{20}$

First we make all rational number with positive denominator

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$\frac{-3}{10}, \frac{-17}{30}, \frac{-7}{15}, \frac{-11}{20}$

LCM (10, 30, 15, 20) = 60

$-\frac{3}{10} \times \frac{6}{6} = \frac{-18}{60}$; $\frac{-17}{30} \times \frac{2}{2} = \frac{-34}{60}$; $\frac{-7}{15} \times \frac{4}{4} = \frac{-28}{60}$

$\frac{-11}{20} \times \frac{3}{3} = \frac{-33}{60}$

$\therefore -18 > -28 > -33 > -34$

$\Rightarrow \frac{-3}{10} > \frac{-7}{15} > \frac{-11}{20} > \frac{-17}{30}$

Q7 Which of the following statements are true:

(i) The rational number $\frac{29}{23}$ lies to the left of zero on the number line.

(ii) The rational number $\frac{-12}{-17}$ lies to the left of zero on the number line.

(iii) The rational number $\frac{3}{4}$ lies to the right of zero on the number line.

(iv) The rational numbers $\frac{-12}{-5}$ and $\frac{-7}{17}$ are on the opposite side of zero on the number line.

(v) The rational numbers $\frac{-21}{5}$ and $\frac{7}{-31}$ are on the opposite side of zero on the number line.

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