Rational numbers on a number line

A. Represent the following rational numbers on number line.

i. $\dfrac{3}{7}$ ii. $\dfrac{-4}{5}$ iii. $\dfrac{-17}{8}$ iv. $\dfrac{3}{4}$

v. $\dfrac{-5}{8}$ vi. $\dfrac{-7}{4}$ vii. $\dfrac{7}{8}$
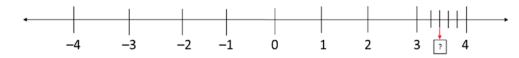
B. Encircle the best option in each of the given statement.

i. To plot $\dfrac{-1}{7}$ on a number line, the number of divisions that will be made between 0 and -1 is/are:

    A. 0   B. −7   C. 7

ii. To plot positive rational numbers on a number line we move towards which of the side 0 on the number line?

    A. Left   B. Right   C. Centre

iii. $\dfrac{1}{10}$ will be plotted between:

    A. 0 & 1   B. 1 & 10   C. − 1 & 0

C. Encircle the rational numbers which is represented on number line given below:

A. $4\dfrac{2}{5}$ B. $3\dfrac{2}{4}$ C. $\dfrac{2}{5}$

Standard (or simplest) form of a rational

A. Write the following rational numbers in standard form.

- $\dfrac{9}{36}$

- $\dfrac{25}{625}$

- $\dfrac{-1302}{-1953}$

- $\dfrac{118}{272}$

- $\dfrac{-6}{-15}$

- $-\dfrac{12}{30}$

B. Match the following rational numbers with their standard form.

Column – 1

a. $\dfrac{32}{40}$

b. $\dfrac{-8}{60}$

c. $\dfrac{-3}{-4}$

d. $\dfrac{-18}{-24}$

Column - 2

i. $\dfrac{-3}{4}$

ii. $\dfrac{4}{5}$

iii. $\dfrac{3}{4}$

iv. $\dfrac{3}{-5}$

Absolute value of a rational number

A. Fill in the Blanks.

i. $\dfrac{5}{-13} = \dfrac{15}{...} = \dfrac{...}{-65}$

ii. $\dfrac{-8}{12} = \dfrac{...}{36} = \dfrac{-96}{...}$

iii. $\dfrac{-315}{1350} = \dfrac{-63}{...} = \dfrac{...}{150}$

B. Express $\dfrac{-5}{6}$ as a rational number with denominator.

i. -54

ii. 63

iii. -30

iv. 18

C. Express $\dfrac{420}{-720}$ as a rational number with numerator.

i. -35

ii. -105

iii. -70

iv. 60

v. 84

D. Find x such that

i. $\dfrac{-21}{8} = \dfrac{x}{56}$

ii. $\dfrac{-13}{-17} = \dfrac{104}{x}$

iii. $\dfrac{x}{95} = -6$

E. Are the three rational numbers: $\dfrac{3}{7}, \dfrac{-3}{7}$ and $\dfrac{3}{-7}$ equivalent?

Operation on rational numbers

A. Add the following rational numbers.

i. $\frac{-3}{5}$ and $\frac{13}{-16}$

ii. $\frac{33}{18}$ and $\frac{17}{26}$

iii. $\frac{-7}{36}$ and $\frac{5}{63}$

iv. $\frac{-4}{10}$ and $\frac{21}{25}$

B. Subtract the following rational numbers.

i. $\frac{3}{8}$ from $\frac{4}{7}$

ii. $\frac{3}{-7}$ from $\frac{-19}{21}$

iii. $\frac{-5}{6}$ from $\frac{1}{3}$

iv. $\frac{-3}{8} - (-5)$

C. Simplify.

i. $\frac{-4}{3} + \frac{7}{18} + \frac{4}{21}$

ii. $1 + \frac{-8}{13} + 15$

iii. $\frac{-7}{20} + \frac{14}{-15} + \frac{1}{10}$

iv. $\frac{-13}{6} + \frac{-13}{7} + \frac{-18}{12}$

D. Find the additive inverse of

i. $\frac{4}{5}$

ii. $\frac{-5}{3}$

E. The sum of two rational numbers is $\frac{1}{2}$. If one of the numbers is $\frac{-15}{3}$, find the other.

F. What number should be added to $\frac{-7}{8}$ so as to get $\frac{3}{4}$?

G. Subtract the sum of $\frac{-25}{12}$ and $\frac{18}{8}$ from the sum of $\frac{38}{5}$ and $\frac{-19}{6}$.

H. Find the multiplicative inverse of

i. $\frac{5}{21}$

ii. $\frac{-27}{19}$

I. Name the property of multiplication illustrated by the following statement.

i. $\frac{-13}{19} \times \frac{19}{-13} = 1$

ii. $\frac{-2}{5} \times \left(\frac{-4}{3} + \frac{5}{8} \right) = \left(\frac{-2}{5} + \frac{-4}{3} \right) + \left(\frac{-2}{5} + \frac{5}{8} \right)$

iii. $\frac{-15}{7} \times \frac{8}{9} = \frac{8}{9} \times \frac{-15}{7}$

J. Verify the following.

i. $\left(\dfrac{-9}{11} + \dfrac{12}{15} \right) \times \dfrac{8}{22} = \dfrac{9}{11} \times \left(\dfrac{-2}{5} + \dfrac{-4}{3} \right)$

ii. $\dfrac{-13}{4} \times \left[\dfrac{3}{8} + \dfrac{-12}{15} \right] = \left[\dfrac{-13}{4} \times \dfrac{-3}{8} \right] + \left[\left(\dfrac{-13}{4} \times \dfrac{-12}{15} \right) \right]$

K. Simplify:

$- 4 \times \left(\dfrac{-11}{8} \right) \times \left(\dfrac{-16}{11} \right) \times \left(\dfrac{-1}{-7} \right)$

L. Verify whether each of the following is true or false.

i. $\dfrac{-3}{4} \div \left(\dfrac{27}{16} \div \dfrac{9}{-32} \right) = \left(\dfrac{-3}{4} \div \dfrac{27}{16} \right) \div \dfrac{9}{32}$

ii. $\dfrac{-85}{18} \div \dfrac{-34}{3} = \dfrac{-34}{3} \div \dfrac{-85}{18}$

To Find a Relational Number Between Two Given Rational Numbers

A. Multiple choice questions.

In between two rational numbers there are _____.

i. No rational numbers

ii. Infinite rational numbers

iii. Three rational numbers

iv. Infinite factors

B. A rational number between $\frac{3}{5}$ and $\frac{4}{5}$ is:

i. $\frac{7}{5}$

ii. $\frac{7}{10}$

iii. $\frac{3}{10}$

iv. $\frac{4}{10}$

C. Which of the following lies between 0 and -12.

i. 0

ii. -3

iii. $\frac{-2}{3}$

iv. $\frac{4}{3}$

D. Write four rational numbers just preceding -2.

E. Write four rational numbers in between $\frac{5}{6}$ and $\frac{2}{3}$.

F. Find out two rational numbers between -3 and -2.

G. Find out six rational number lying between $\frac{-4}{-8}$ and $\frac{3}{8}$.

H. Find out ten rational numbers lying between $\frac{7}{13}$ and "$\frac{-4}{13}$.

Multiplication of rational numbers

A. Simplify the following:

i. $\left(\frac{-2}{3}\right) \times \left(\frac{5}{9}\right)$

ii. $\left(\frac{7}{4}\right) \times \left(\frac{-8}{21}\right)$

iii. $\left(\frac{-11}{15}\right) \times \left(\frac{-3}{22}\right)$

iv. $\left(\frac{-6}{13}\right) \times \left(\frac{-13}{18}\right)$

v. $\left(\frac{12}{15}\right) \times \left(\frac{-10}{9}\right)$

B. Multiply and express the result in simplest form:

i. $\left(\frac{-7}{8}\right) \times \left(\frac{4}{21}\right)$

ii. $\left(\frac{-2}{5}\right) \times \left(\frac{-10}{3}\right)$

iii. $\left(\frac{15}{32}\right) \times \left(\frac{-16}{45}\right)$

iv. $\left(\frac{3}{10}\right) \times \left(\frac{-5}{6}\right)$

v. $\left(\frac{-9}{11}\right) \times \left(\frac{11}{27}\right)$

C. Find the product of the following rational numbers:

i. $\left(\frac{-3}{7}\right) \times \left(\frac{-2}{5}\right) \times \left(\frac{7}{6}\right)$

ii. $\left(\frac{5}{8}\right) \times \left(\frac{-4}{9}\right) \times \left(\frac{3}{10}\right)$

iii. $\left(\frac{-2}{3}\right) \times \left(\frac{-3}{4}\right) \times \left(\frac{1}{2}\right)$

iv. $\left(\frac{-1}{5}\right) \times \left(\frac{-10}{3}\right) \times \left(\frac{9}{2}\right)$

v. $\left(\frac{-8}{9}\right) \times \left(\frac{-3}{2}\right) \times \left(\frac{-1}{4}\right)$

D. Word Problems:

i. A wire is $\frac{5}{6}$ meters long. It is cut into pieces, each of length $\left(\frac{2}{3}\right)$ of the original. What is the length of one piece?

ii. A tank is filled with water up to $\frac{4}{7}$ of its capacity. If it is then multiplied by $\left(\frac{3}{5}\right)$ times its current volume, what is the new volume of water in the tank?

iii. A recipe needs $\left(\frac{3}{4}\right)$ cups of milk. If you are making $\frac{2}{3}$ of the recipe, how much milk will you need?

iv. The temperature dropped by $\left(\frac{-2}{5}\right)$ °C each hour. What is the total temperature drop in $\frac{4}{3}$ hours?

v. A painter paints $\left(\frac{2}{9}\right)$ of a wall in one hour. How much of the wall will he paint in $\left(\frac{-3}{2}\right)$ hours?

E. Fill in the blanks:

i. $\left(\frac{-2}{3}\right) \times$ _____ $= \frac{4}{9}$

ii. $\left(\frac{3}{5}\right) \times \left(\frac{-10}{9}\right) =$ _____

iii. _____ $\times \left(\frac{5}{8}\right) = \frac{-25}{48}$

iv. $\left(\frac{-4}{7}\right) \times \left(\frac{-7}{3}\right) =$ _____

v. $\left(\frac{2}{9}\right) \times$ _____ $= \frac{-4}{15}$