MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

RATIONAL NUMBERS

Example

1. Express $\dfrac{33}{-44}$ in standard form.

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

B. $\dfrac{-5}{4}$

C. $\dfrac{-7}{4}$

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

Answer: A

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2. Which of the numbers $\dfrac{3}{-4}$ or $\dfrac{-5}{6}$ is greater ?

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

B. $\dfrac{-5}{6}$

C. None of these

D. Both are equal

Answer: A

3. Arrange the numbers $\dfrac{-3}{5}$, $\dfrac{7}{-10}$ and $\dfrac{-5}{8}$ in ascending order.

A. $\dfrac{-3}{5} < \dfrac{7}{-10} < \dfrac{-5}{8}$

B. $\dfrac{7}{-10} < \dfrac{-5}{8} < \dfrac{-3}{5}$

C. $\dfrac{-5}{8} < \dfrac{7}{-10} < \dfrac{-3}{5}$

D. none of these

Answer: B

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4. REPRESENT $\dfrac{1}{2}$ AND $-\dfrac{1}{2}$ on the number line.

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5. Represent $\dfrac{2}{3}$ and $-\dfrac{2}{3}$ on the number line.

6. Represent $\dfrac{13}{5}$ and $\dfrac{-13}{5}$ on the number line.

7. Find the sum :

$(i)\ \dfrac{7}{9} + \dfrac{-11}{9}$　　$(ii)\ \dfrac{8}{-11} + \dfrac{3}{11}$

8. Find the sum: $\dfrac{-5}{6} + \dfrac{4}{9}$

A. $\dfrac{-7}{18}$

B. $\dfrac{-7}{28}$

C. $\dfrac{-7}{38}$

D. $\dfrac{-7}{48}$

Answer: A

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9. Find the sum: $\dfrac{-9}{16} + \dfrac{5}{12}$

A. $\dfrac{-9}{48}$

B. $\dfrac{-11}{48}$

C. $\dfrac{-5}{48}$

D. $\dfrac{-7}{48}$

Answer: D

Solved Examples

1. Find the additive inverse of :

$(i) \dfrac{5}{9}$ $(ii) \dfrac{-15}{8}$ $(iii) \dfrac{9}{-11}$ $(iv) \dfrac{-6}{-7}$

2. (i) Subtract $\dfrac{3}{4}$ from $\dfrac{2}{3}$. (ii) Subtract $\dfrac{-5}{7}$ from $\dfrac{-2}{5}$.

3. The sum of two rational numbers is -5. If one of them is $\dfrac{-13}{6}$, find the other.

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

B. $\dfrac{-11}{6}$

C. $\dfrac{-13}{6}$

D. $\dfrac{-17}{6}$

Answer: D

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4. What number should be added to $\dfrac{-7}{8}$ to get $\dfrac{4}{9}$?

A. $\dfrac{94}{72}$

B. $\dfrac{93}{72}$

C. $\dfrac{95}{72}$

D. $\dfrac{96}{72}$

Answer: C

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5. Evaluate $\dfrac{3}{5} + \dfrac{7}{3} + \dfrac{-11}{5} + \dfrac{-2}{3}$.

A. $\dfrac{2}{15}$

B. $\dfrac{1}{15}$

C. $\dfrac{3}{15}$

D. $\dfrac{4}{15}$

Answer: B

6. Simplify: $\left(\dfrac{4}{7} + \dfrac{-8}{9} + \dfrac{-5}{21} + \dfrac{1}{3} \right)$.

A. $\dfrac{2}{9}$

B. $\dfrac{-1}{9}$

C. $\dfrac{-2}{9}$

D. none of these

Answer: C

7. What should be subtracted from $\dfrac{-5}{7}$ to get -1 ?

A. $\dfrac{3}{7}$

B. $\dfrac{2}{7}$

C. $\dfrac{5}{7}$

D. $\dfrac{6}{7}$

Answer: B

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8. Find the product:

$$\dfrac{-7}{8} \times \dfrac{3}{5}$$

A. $\dfrac{21}{40}$

B. $\dfrac{11}{40}$

C. $\dfrac{-11}{40}$

D. $\dfrac{-21}{40}$

Answer: D

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9. Find each of the following products:

$(i)\dfrac{-3}{7} \times \dfrac{14}{5}$ $(ii)\dfrac{13}{6} \times \dfrac{-18}{91}$ $(iii)\dfrac{-11}{9} \times \dfrac{-51}{44}$

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10. Find the reciprocal of each of the following:

$(i)12$ $(ii)-8$ $(iii)\dfrac{5}{6}$ $(iv)\dfrac{-14}{17}$

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11. Verify that:

(i) $\left(\dfrac{-3}{16} \times \dfrac{8}{15} \right) = \left(\dfrac{8}{15} \times \dfrac{-3}{16} \right)$

(ii) $\dfrac{2}{3} \times \left(\dfrac{6}{7} \times \dfrac{-4}{15} \right) = \left(\dfrac{2}{3} \times \dfrac{6}{7} \right) \times \dfrac{-14}{15}$

(iii) $\dfrac{5}{6} \times \left(\dfrac{-4}{5} + \dfrac{-7}{10} \right) = \left(\dfrac{5}{6} \times \dfrac{-4}{5} \right) + \left(\dfrac{5}{6} \times \dfrac{-7}{10} \right)$

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12. Divide:

$\dfrac{9}{16}$ by $\dfrac{5}{8}$

A. $\dfrac{9}{10}$

B. $\dfrac{3}{2}$

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

D. $\dfrac{9}{4}$

Answer: $\dfrac{9}{10}$

13. The product of two numbers is $\dfrac{-28}{27}$. If one of the numbers is $\dfrac{-4}{9}$, find the other.

A. $\dfrac{7}{3}$

B. $\dfrac{7}{5}$

C. $\dfrac{8}{3}$

D. $\dfrac{11}{3}$

Answer: A

14. Fill in blanks: $\dfrac{27}{16} \div (\text{........}) = \dfrac{-15}{8}$.

A. $\dfrac{-7}{10}$

B. $\dfrac{-9}{10}$

C. $\dfrac{-11}{10}$

D. $\dfrac{-8}{10}$

Answer: B

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15. Find a rational number lying between $\dfrac{1}{3}$ and $\dfrac{1}{2}$.

A. $\dfrac{5}{12}$

B. $\dfrac{4}{12}$

C. $\dfrac{6}{12}$

D. $\dfrac{3}{12}$

Answer: A

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16. Find three rational numbers lying between 3 and 4.

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17. Find 20 rational numbers between $\dfrac{-5}{6}$ and $\dfrac{5}{8}$.

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18. Find 15 rational numbers between -2 and 0.

19. Write 9 rational numbers between 1 and 2.

Exercise 1 A

1. Express $\dfrac{-3}{5}$ as a rational number with denominator 20

A. $\dfrac{-12}{20}$

B. $\dfrac{-13}{20}$

C. $\dfrac{-14}{20}$

D. $\dfrac{-15}{20}$

Answer: A

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2. Express $\dfrac{-42}{98}$ as a rational number with denominator 7.

A. $\dfrac{-4}{7}$

B. $\dfrac{-5}{7}$

C. $\dfrac{-3}{7}$

D. $\dfrac{-6}{7}$

Answer: C

3. Express $\dfrac{-48}{60}$ as a rational number with denominator 5.

A. $\dfrac{-4}{9}$

B. $\dfrac{-4}{7}$

C. $\dfrac{-4}{5}$

D. $\dfrac{-6}{5}$

Answer: C

4. Express of the rational numbers in standard form:

$(i) \dfrac{-12}{30}$ $(ii) \dfrac{-14}{49}$ $(iii) \dfrac{-24}{64}$ $(iv) \dfrac{-36}{-63}$

5. Which of the two rational numbers is greater in the given pair?

(i) $\frac{3}{8}$ or 0 $\qquad$ (ii) $\frac{-2}{9}$ or 0 $\quad$ (iii) $\frac{-3}{4}$ or $\frac{1}{4}$

(iv) $\frac{-5}{7}$ or $\frac{-4}{7}$ $\quad$ (v) $\frac{2}{3}$ or $\frac{3}{4}$ $\qquad$ (vi) $\frac{-1}{2}$ or -1

6. Which of the two rational numbers is greater in the given pair?

(i) $\frac{-4}{3}$ or $\frac{-8}{7}$ $\qquad$ (ii) $\frac{7}{-9}$ or $\frac{-5}{8}$ $\quad$ (iii) $\frac{-1}{3}$ or $\frac{4}{-5}$

(iv) $\frac{9}{-13}$ or $\frac{7}{-12}$ $\quad$ (v) $\frac{4}{-5}$ or $\frac{-7}{10}$ $\quad$ (vi) $\frac{-12}{5}$ or -3

7. Fill in the blanks with the correct symbol out of $>$, $=$ and $<$:

$(i)\ \dfrac{-3}{7}$ .... $\dfrac{6}{-13}$ $\qquad$ $(ii)\ \dfrac{5}{-13}$ ..... . $\dfrac{-35}{91}$ $\qquad$ $(iii)\ -2$ .... $\dfrac{-13}{5}$

$(iv)\ \dfrac{-2}{3}$ .... $\dfrac{5}{-8}$ $\qquad$ $(v)\ 0$ .... $\dfrac{-3}{-5}$ $\qquad$ $(vi)\ \dfrac{-8}{9}$ .... $\dfrac{-9}{10}$

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8. Arrange the following rational numbers in ascending order:

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

$(ii)\ \dfrac{-3}{4},\ \dfrac{5}{-12},\ \dfrac{-7}{16},\ \dfrac{9}{-24}$

$(iii)\ \dfrac{3}{-5},\ \dfrac{-7}{10},\ \dfrac{-11}{15},\ \dfrac{-13}{20}$

$(iv)\ \dfrac{-4}{7},\ \dfrac{-9}{14},\ \dfrac{13}{-28},\ \dfrac{-23}{42}$

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9. Arrange the following rational numbers in descending order:

(i) $-2, \dfrac{-13}{6}, \dfrac{8}{-3}, \dfrac{1}{3}$

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

(iii) $\dfrac{-5}{6}, \dfrac{-7}{2}, \dfrac{-13}{18}, \dfrac{23}{-24}$

(iv) $\dfrac{-10}{11}, \dfrac{-19}{11}, \dfrac{-23}{33}, \dfrac{-39}{44}$

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10. Which of the following statements are true and which are false?

(i) Every whole number is a rational number.

(ii) Every integer is a rational number.

(iii) 0 is a whole number but it is not a rational number.

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1. Represent each of the following numbers on the number line.

$(i)\,\frac{1}{3}$ $(ii)\,\frac{2}{7}$ $(iii)\,1\frac{3}{4}$ $(iv)\,2\frac{2}{5}$

$(v)\,3\frac{1}{2}$ $(vi)\,5\frac{5}{7}$ $(vii)\,4\frac{2}{3}$ $(viii)\,8$

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2. Represent each of the following numbers on the number line:

$(i)\,\frac{-1}{3}$ $(ii)\,\frac{-3}{4}$ $(iii)\,-1\frac{2}{3}$ $(iv)\,-3\frac{1}{7}$

$(v)\,-4\frac{3}{5}$ $(vi)\,-2\frac{5}{6}$ $(vii)\,-3$ $(viii)\,-2\frac{7}{8}$

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3. Which of the following statements are true and which are false?

(i) $\dfrac{-3}{5}$ lies to the left of 0 on the number line.

(ii) $\dfrac{-12}{7}$ lies to the right of 0 on the number line.

(iii) The rational numbers $\dfrac{1}{3}$ and $\dfrac{-5}{2}$ are on opposite sides of 0 on the number line.

(iv) The rational number $\dfrac{-18}{-13}$ lies to the left of 0 on the number line.

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Exercise 1 C

1. Add the following rational numbers:

(i) $\dfrac{-2}{5}$ and $\dfrac{4}{5}$ (ii) $\dfrac{-6}{11}$ and $\dfrac{-4}{11}$ (iii) $\dfrac{-11}{8}$ and $\dfrac{5}{8}$

(iv) $\dfrac{-7}{3}$ and $\dfrac{1}{3}$ (v) $\dfrac{5}{6}$ and $\dfrac{-1}{6}$ (vi) $\dfrac{-17}{15}$ and $\dfrac{-1}{15}$

2. Add the following rational numbers:

(i) $\dfrac{3}{4}$ and $\dfrac{-3}{5}$

(ii) $\dfrac{5}{8}$ and $\dfrac{-7}{12}$

,(iii) $\dfrac{-8}{9}$ and $\dfrac{11}{6}$

,((iv) $\dfrac{-5}{16}$ and $\dfrac{7}{24}$

,(v) $\dfrac{7}{-18}$ and $\dfrac{8}{27}$

,(vi) $\dfrac{1}{-12}$ and $\dfrac{2}{-15}$,

(vii) -1 and $\dfrac{3}{4}$

,(viii) 2 and $\dfrac{-5}{4}$

,(ix) 0 and $\dfrac{-2}{5}$

3. Verify the following:

(i) $\dfrac{-12}{5} + \dfrac{2}{7} = \dfrac{2}{7} + \dfrac{-12}{5}$

(ii) $\dfrac{-5}{8} + \dfrac{-9}{13} = \dfrac{-9}{13} + \dfrac{-5}{8}$

(iii) $3 + \dfrac{-7}{12} = \dfrac{-7}{12} + 3$

(iv) $\dfrac{2}{-7} + \dfrac{12}{-35} = \dfrac{12}{-35} + \dfrac{2}{-7}$

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4. Verify the following:

(i) $\left(\dfrac{3}{4} + \dfrac{-2}{5}\right) + \dfrac{-7}{10} = \dfrac{3}{4} + \left(\dfrac{-2}{5} + \dfrac{-7}{10}\right)$

(ii) $\left(\dfrac{-7}{11} + \dfrac{2}{-5}\right) + \dfrac{-13}{22} = \dfrac{-7}{11} + \left(\dfrac{2}{-5} + \dfrac{-13}{22}\right)$

(iii) $-1 + \left(\dfrac{-2}{3} + \dfrac{-3}{4}\right) = \left(-1 + \dfrac{-2}{3}\right) + \dfrac{-3}{4}$

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5. Fill in the blanks

(i) $\left(\dfrac{-3}{17}\right) + \left(\dfrac{-12}{5}\right) = \left(\dfrac{-12}{5}\right) + (\ldots\ldots..)$

(ii) $-9 + \dfrac{-21}{8} = (\ldots\ldots.) + (-9)$

(iii)

$\left(\dfrac{-8}{13} + \dfrac{3}{7}\right) + \left(\dfrac{-13}{4}\right) = (\ldots\ldots.) + \left[\dfrac{3}{7} + \left(\dfrac{-13}{4}\right)\right]$

(iv) $-12 + \left(\dfrac{7}{12} + \dfrac{-9}{11}\right) = \left(-12 + \dfrac{7}{12}\right) + (\ldots\ldots..)$

(v) $\dfrac{19}{-5} + \left(\dfrac{-3}{11} + \dfrac{-7}{8}\right) = \left\{\dfrac{19}{-5} + (\ldots\ldots..)\right\} + \dfrac{-7}{8}$

(vi) $\dfrac{-16}{7} + \ldots\ldots = \ldots\ldots. + \dfrac{-16}{7} = \dfrac{-16}{7}$

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6. Find the additive inverse of each of the following :

(i) $\dfrac{1}{3}$ (ii) $\dfrac{23}{9}$ (iii) -18 (iv) $\dfrac{-17}{8}$ (v) $\dfrac{15}{-4}$

(vi) $\dfrac{-16}{-5}$ (vii) $\dfrac{-3}{11}$ (viii) 0 (ix) $\dfrac{19}{-6}$ (x) $\dfrac{-8}{-7}$

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7. Subtract:

(i) $\dfrac{3}{4}$ from $\dfrac{1}{3}$

(ii) $\dfrac{-5}{6}$ from $\dfrac{1}{3}$

(iii) $\dfrac{-8}{9}$ from $\dfrac{-3}{5}$

(iv) $\dfrac{-9}{7}$ from -1

(v) $\dfrac{-18}{11}$ from 1

(vi) $\dfrac{-13}{9}$ from 0

(vii) $\dfrac{-32}{13}$ form $\dfrac{-6}{5}$

(viii) -7 from $\dfrac{-4}{7}$

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8. Using the rearrangement property find the sum:

(i) $\dfrac{4}{3} + \dfrac{3}{5} + \dfrac{-2}{3} + \dfrac{-11}{5}$

(ii) $\dfrac{-8}{3} + \dfrac{-1}{4} + \dfrac{-11}{6} + \dfrac{3}{8}$

(iii) $\dfrac{-13}{20} + \dfrac{11}{14} + \dfrac{-5}{7} + \dfrac{7}{10}$

(iv) $\dfrac{-6}{7} + \dfrac{-5}{6} + \dfrac{-4}{9} + \dfrac{-15}{7}$

9. The sum of two rational numbers is -2. If one of the numbers is $\dfrac{-14}{5}$, find the other.

A. $\dfrac{7}{5}$

B. $\dfrac{9}{5}$

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

D. $\dfrac{8}{5}$

Answer: C

10. The sum of two rational numbers is $\dfrac{-1}{2}$. If one of the numbers is $\dfrac{5}{6}$, find the other.

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

B. $\dfrac{4}{7}$

C. $\dfrac{-4}{7}$

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

Answer: A

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11. What number should be added to $\dfrac{-5}{8}$ so as to get $\dfrac{-3}{2}$?

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12. What number should be added to -1 so as to get $\dfrac{5}{7}$?

A. $\dfrac{-11}{7}$

B. $\dfrac{-12}{7}$

C. $\dfrac{12}{7}$

D. $\dfrac{11}{7}$

Answer: $\dfrac{12}{7}$

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13. What number should be subtracted from $\dfrac{-2}{3}$ to get $\dfrac{-1}{6}$?

A. $-\dfrac{3}{2}$

B. $-\dfrac{1}{2}$

C. $-\dfrac{7}{2}$

D. $-\dfrac{9}{2}$

Answer: B

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14. (i) Which rational number is its own additive inverse?

(ii) Is the difference of two rational numbers a rational number?

(iii) Is the addition commutative on rational numbers?

(iv) Is addition associative on rational numbers?

(v) Is subtraction commutative on rational numbers?

(vi) Is subtraction associative on rational numbers?

(vii) What is the negative of a negative rational number?

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Exercise 1 D

1. Find each of the following products:

$(i) \frac{3}{5} \times \frac{-7}{5}$ $(ii) \frac{-9}{2} \times \frac{5}{4}$ $(iii) \frac{-6}{11} \times \frac{-5}{3}$

$(iv) \frac{-2}{3} \times \frac{6}{7}$ $(v) \frac{-12}{5} \times \frac{10}{-3}$ $(vi) \frac{25}{-9} \times \frac{3}{-10}$

$(vii) \frac{5}{-18} \times \frac{-9}{20}$ $(viii) \frac{-13}{15} \times \frac{-25}{26}$ $(ix) \frac{16}{-21} \times \frac{14}{5}$

$(x) \frac{-7}{6} \times 24$ $(xi) \frac{7}{24} \times (-48)$ $(xii) \frac{-13}{5} \times (-10)$

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2. Verify each of the following:

(i) $\dfrac{3}{7} \times \dfrac{-5}{7} = \dfrac{-5}{9} \times \dfrac{3}{7}$

(ii) $\dfrac{8}{7} \times \dfrac{13}{9} = \dfrac{13}{9} \times \dfrac{-8}{7}$

(iii) $\dfrac{-12}{5} \times \dfrac{7}{-36} = \dfrac{7}{-36} \times \dfrac{-12}{5}$

(iv) $-8 \times \dfrac{-13}{12} = \dfrac{-13}{12} \times (-8)$

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3. Verify each of the following:

(i) $\left(\dfrac{5}{7} \times \dfrac{12}{13}\right) \times \dfrac{7}{18} = \dfrac{5}{7} \times \left(\dfrac{12}{13} \times \dfrac{7}{18}\right)$

(ii) $\dfrac{-13}{24} \times \left(\dfrac{-12}{5} \times \dfrac{35}{36}\right) = \left(\dfrac{-13}{24} \times \dfrac{-12}{5}\right) \times \dfrac{35}{36}$

(iii) $\left(\dfrac{-9}{5} \times \dfrac{-10}{3}\right) \times \dfrac{21}{-4} = \dfrac{-9}{5} \times \left(\dfrac{-10}{3} \times \dfrac{21}{-4}\right)$

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4. Fill in the blanks:

(i) $\dfrac{-23}{17} \times \dfrac{18}{35} = \dfrac{18}{35} \times (\text{........})$

(ii) $-38 \times \dfrac{-7}{19} = \dfrac{-7}{19} \times (\text{.....})$

(iii) $\left(\dfrac{15}{7} \times \dfrac{-21}{10}\right) \times \dfrac{-5}{6} = (\text{........}) \times \left(\dfrac{-21}{10} \times \dfrac{-5}{6}\right)$

(iv) $\dfrac{-12}{5} \times \left(\dfrac{4}{15} \times \dfrac{25}{-16}\right) = \left(\dfrac{-12}{5} \times \dfrac{4}{15}\right) \times (\text{........})$

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5. Find the multiplicative inverse (i.e., reciprocal) of :

(i) $\dfrac{13}{25}$ (ii) $\dfrac{-17}{12}$ (iii) $\dfrac{-7}{24}$ (iv) 18 (v) -16

(vi) $\dfrac{-3}{-5}$ (vii) -1 (viii) $\dfrac{0}{2}$ (ix) $\dfrac{2}{-5}$ (x) $\dfrac{-1}{8}$

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6. Find the value of :

(i) $\left(\dfrac{5}{8}\right)^{-1}$ (ii) $\left(\dfrac{-4}{9}\right)^{-1}$ (iii) $(-7)^{-1}$ (iv) $\left(\dfrac{1}{-3}\right)^{-1}$

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7. Verify the following:

(i) $\dfrac{3}{7} \times \left(\dfrac{5}{6} + \dfrac{12}{13}\right) = \left(\dfrac{3}{7} \times \dfrac{5}{6}\right) + \left(\dfrac{3}{7} \times \dfrac{12}{13}\right)$

(ii)

$\dfrac{-15}{4} \times \left(\dfrac{3}{7} + \dfrac{-12}{5}\right) = \left(\dfrac{-15}{4} \times \dfrac{3}{7}\right) + \left(\dfrac{-15}{4} \times \dfrac{-12}{5}\right)$

(iii) $\left(\dfrac{-8}{3} + \dfrac{-13}{12}\right) \times \dfrac{5}{6} = \left(\dfrac{-8}{3} \times \dfrac{5}{6}\right) + \left(\dfrac{-13}{12} \times \dfrac{5}{6}\right)$

(iv)

$\dfrac{-16}{7} \times \left(\dfrac{-8}{9} + \dfrac{-7}{6}\right) = \left(\dfrac{-16}{7} \times \dfrac{-8}{9}\right) + \left(\dfrac{-16}{7} \times \dfrac{-7}{6}\right)$

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8. Name the property of multiplication illustrated by the following statements:

(i) $\dfrac{-15}{8} \times \dfrac{-12}{7} = \dfrac{-12}{7} \times \dfrac{-15}{8}$

(ii) $\left(\dfrac{-2}{3} \times \dfrac{7}{9}\right) \times \dfrac{-9}{5} = \dfrac{-2}{3} \times \left(\dfrac{7}{9} \times \dfrac{-9}{5}\right)$

(iii) $\dfrac{-3}{4} \times \left(\dfrac{-5}{6} + \dfrac{7}{8}\right) = \left(\dfrac{-3}{4} \times \dfrac{-5}{6}\right) + \left(\dfrac{-3}{4} \times \dfrac{7}{8}\right)$

(iv) $\dfrac{-16}{9} \times 1 = 1 \times \dfrac{-16}{9} = \dfrac{-16}{9}$

(v) $\dfrac{-11}{15} \times \dfrac{15}{-11} = \dfrac{15}{-11} \times \dfrac{-11}{15} = 1$

(vi) $\dfrac{-7}{5} \times 0 = 0$

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9. Fill in the blanks:

(i) The product of a rational number and its reciprocal is ....

(ii) Zero has .... reciprocal.

(iii) The numbers .... and ...... are their own reciprocals.

(iv) Zero is .... the reciprocal of any number.

(v) The reciprocal of a, where $a \neq 0$, is ....

(vi) The reciprocal of $\dfrac{1}{a}$, where $a \neq 0$, is ....

(vii) The reciprocal of a positive rational number is ....

(viii) The reciprocal of a negative rational number is ....

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Exercise 1 E

1. Simplify:

$(i)\ \dfrac{4}{9} \div \dfrac{-5}{12}$ $(ii)\ -8 \div \dfrac{-7}{16}$ $(iii)\ \dfrac{-12}{7} \div (-18)$

$(iv)\ \dfrac{-1}{10} \div \dfrac{-8}{5}$ $(v)\ \dfrac{-16}{35} \div \dfrac{-15}{14}$ $(vi)\ \dfrac{-65}{14} \div \dfrac{13}{7}$

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2. Verify whether the given statement is true or false:

(i) $\dfrac{13}{5} \div \dfrac{26}{10} = \dfrac{26}{10} \div \dfrac{13}{5}$

(ii) $-9 \div \dfrac{3}{4} = \dfrac{3}{4} \div (-9)$

(iii) $\dfrac{-8}{9} \div \dfrac{-4}{3} = \dfrac{-4}{3} \div \dfrac{-8}{9}$

(iv) $\dfrac{-7}{24} \div \dfrac{3}{-16} = \dfrac{3}{-16} \div \dfrac{-7}{24}$

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3. Verify whether the given statement is true or false:

$\left(\dfrac{5}{9} \div \dfrac{1}{3} \right) \div \dfrac{5}{2} = \dfrac{5}{9} \div \left(\dfrac{1}{3} \div \dfrac{5}{2} \right)$

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4. The product of two rational numbers is -9. If one of the numbers is -12, find the other.

A. $\dfrac{7}{4}$

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

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

D. $\dfrac{9}{4}$

Answer: B

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5. The product of two rational numbers is $\dfrac{-16}{9}$. If one of the numbers is $\dfrac{-4}{3}$, find the other.

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

B. $\dfrac{-4}{9}$

C. $\dfrac{4}{9}$

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

Answer: $\dfrac{4}{3}$

6. By what rational number should we multiply $\dfrac{-15}{56}$ to get $\dfrac{-5}{7}$?

A. $\dfrac{8}{3}$

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

C. $\dfrac{5}{3}$

D. $\dfrac{7}{3}$

Answer: A

7. By what rational number should $\dfrac{-8}{39}$ be multiplied to obtain $\dfrac{1}{26}$?

A. $\dfrac{-3}{8}$

B. $\dfrac{-3}{16}$

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

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

Answer: B

8. By what number should $\dfrac{-33}{8}$ be divided to get $\dfrac{-11}{2}$?

9. Divide the sum of $\dfrac{13}{5}$ and $\dfrac{-12}{7}$ by the product of $\dfrac{-31}{7}$ and $\dfrac{1}{-2}$.

10. Divide the sum of $\dfrac{65}{12}$ and $\dfrac{8}{3}$ by their difference.

11. Fill in the blanks:

(i) $\dfrac{9}{8} \div (\ldots\ldots) = \dfrac{-3}{2}$

(ii) $(\ldots\ldots) \div \left(\dfrac{-7}{5}\right) = \dfrac{10}{19}$

(iii) $(\ldots\ldots) \div (-3) = \dfrac{-4}{15}$

(iv) $(-12) \div (\ldots\ldots) = \dfrac{-6}{5}$

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12. (i) Are rational numbers always closed under division?

(ii) Are rational numbers always commutative under division?

(iii) Are rational numbers always associative under division?

(iv) Can we divide 1 by 0 ?

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1. Find a rational number between $\dfrac{1}{4}$ and $\dfrac{1}{3}$.

A. $\dfrac{9}{24}$

B. $\dfrac{7}{24}$

C. $\dfrac{5}{24}$

D. $\dfrac{11}{24}$

Answer: B

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2. Find a rational number between 2 and 3.

A. $\dfrac{9}{2}$

B. $\dfrac{7}{2}$

C. $\dfrac{5}{2}$

D. $\dfrac{11}{2}$

Answer: C

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3. Find a rational number between $\dfrac{-1}{3}$ and $\dfrac{1}{2}$.

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4. Find two rational numbers between -3 and -2.

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5. Find three rational numbers between 4 and 5.

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6. Find three rational numbers between $\dfrac{2}{3}$ and $\dfrac{3}{4}$

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7. Find 10 rational numbers between $\dfrac{-3}{4}$ and $\dfrac{5}{6}$.

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8. v31

Exercise 1 G

1. From a rope $11m$ long, two pieces of lengths $2\dfrac{3}{5}m$ and $3\dfrac{3}{10}m$ are cut off. What is the length of the remaining rope?

A. $5\dfrac{1}{10}m$

B. $5\dfrac{2}{10}m$

C. $4\dfrac{1}{10}m$

D. $3\dfrac{1}{10}m$

Answer: A

2. A drum full of rice weighs $40\frac{1}{6}kg$. If the empty drum weighs $13\frac{3}{4}kg$, find the weight of rice in the drum.

3. A basket contains three types of fruits weighing $19\frac{1}{3}kg$ in all. If $8\frac{1}{9}kg$ of these be apples, $3\frac{1}{6}kg$ be oranges and the rest pears, what is the weight of the pears in the basket?

4. On one day a rickshaw puller earned Rs. 160. Out of his earnings he spent Rs. $26\frac{3}{5}$ on tea and snacks, Rs. $50\frac{1}{2}$ on food and Rs. $16\frac{2}{5}$ on repairs of the rickshaw. How much did he save on that day?

A. $Rs.\ 66\dfrac{1}{2}$

B. $Rs.\ 76\dfrac{1}{2}$

C. $Rs.\ 88\dfrac{1}{2}$

D. $Rs.\ 69\dfrac{1}{2}$

Answer: A

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5. Find the cost of $3\dfrac{2}{5}$ metres of cloth at Rs. $63\dfrac{3}{4}$ per metre.

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6. A car is moving at an average speed of $60\dfrac{2}{5}km/hr$. How much distance will it cover in $6\dfrac{1}{4}$ hours?

7. Find the area of a rectangular park which is $36\dfrac{3}{5}m$ long and $16\dfrac{2}{3}$m broad.

8. Find the area of square plot of land whose each side measures $8\dfrac{1}{2}$ metres.

9. One litre of petrol costs Rs. $63\dfrac{3}{4}$. What is the cost of 34 litres of petrol?

10. An aeroplane covers 1020 km in an hour. How much distance will it cover in $4\dfrac{1}{6}$ hours?

    A. 4255 km

    B. 4240 km

    C. 4150 km

    D. 4250 km

Answer: D

11. The cost of $3\dfrac{1}{2}$ metres of cloth is Rs. $166\dfrac{1}{4}$. What is the cost of one metre of cloth?

12. A cord of length $71\dfrac{1}{2}m$ has been cut into 26 pieces of equal length. What is the length of each piece?

13. The area of a room is $65\dfrac{1}{4}m^2$. If its breadth is $5\dfrac{7}{16}$ metres, what is its length ?

A. 12 m

B. 13 m

C. 14 m

D. 17 m

Answer: A

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14. The product of two fractions is $9\dfrac{3}{5}$. If one of the fractions is $9\dfrac{3}{7}$, find the other.

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15. In a school, $\dfrac{5}{8}$ of the students are boys. If there are 240 girls, find the number of boys in the school.

A. 450

B. 480

C. 400

D. 460

Answer: C

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16. After reading $\dfrac{7}{9}$ of a book, 40 pages are left. How many pages are there in the book?

A. 170

B. 280

C. 180

D. 200

Answer: C

17. Rita has Rs. 300. She spent $\frac{1}{3}$ of her money on notebooks and $\frac{1}{4}$ of the remainder on stationery items. How much money is left with her?

18. Amit earns Rs.32000 per month. He spends $\frac{1}{4}$ of his income on food, $\frac{3}{10}$ of the remainder on house rent and $\frac{5}{21}$ of the remainder on the education of children. How much money is still left with him?

A. Rs. 12600

B. Rs. 12500

C. Rs. 12700

D. Rs. 12800

Answer: D

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19. If $\dfrac{3}{5}$ of a number exceeds its $\dfrac{2}{7}$ by 44, find the number.

A. 120

B. 140

C. 135

D. 145

Answer: B

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20. At a cricket test match $\dfrac{2}{7}$ of the spectators were in a covered place while 15000 were in open Find the total number of spectators.

    A. 20000

    B. 21000

    C. 22000

    D. 23000

Answer: B

1. $\left(\dfrac{-5}{16} + \dfrac{7}{12} \right) = ?$

A. $-\dfrac{7}{48}$

B. $\dfrac{1}{24}$

C. $\dfrac{13}{48}$

D. $\dfrac{1}{3}$

Answer: C

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2. $\left(\dfrac{8}{-15} + \dfrac{4}{-3} \right) = ?$

A. $\dfrac{28}{15}$

B. $\dfrac{-28}{15}$

C. $\dfrac{-4}{5}$

D. $\dfrac{-4}{15}$

Answer: B

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3. $\left(\dfrac{7}{-26} + \dfrac{16}{39}\right) = ?$

A. $\dfrac{11}{78}$

B. $\dfrac{-11}{78}$

C. $\dfrac{11}{39}$

D. $\dfrac{-11}{39}$

Answer: A

4. $\left(3 + \dfrac{5}{-7} \right) = ?$

A. $\dfrac{-16}{7}$

B. $\dfrac{16}{7}$

C. $\dfrac{-26}{7}$

D. $\dfrac{-8}{7}$

Answer: B

5. $\left(\dfrac{31}{-4} + \dfrac{-5}{8} \right) = \ ?$

A. $\dfrac{67}{8}$

B. $\dfrac{57}{8}$

C. $\dfrac{-57}{8}$

D. $\dfrac{-67}{8}$

Answer: D

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6. What should be added to $\dfrac{7}{12}$ to get $\dfrac{-4}{15}$?

A. $\dfrac{17}{20}$

B. $\dfrac{-17}{20}$

C. $\dfrac{7}{20}$

D. $\dfrac{-7}{20}$

Answer: B

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7. $\left(\dfrac{2}{3} + \dfrac{-4}{5} + \dfrac{7}{15} + \dfrac{-11}{20} \right) = ?$

A. $\dfrac{-1}{5}$

B. $\dfrac{-4}{15}$

C. $\dfrac{-13}{60}$

D. $\dfrac{-7}{30}$

Answer: C

8. The sum of two numbers is $\dfrac{-4}{3}$. If one of the numbers is -5, what is the other?

A. $\dfrac{-11}{3}$

B. $\dfrac{11}{3}$

C. $\dfrac{-19}{3}$

D. $\dfrac{19}{3}$

Answer: B

9. What should be added to $\dfrac{-5}{7}$ ot get $\dfrac{-2}{3}$?

A. $\dfrac{-29}{21}$

B. $\dfrac{29}{21}$

C. $\dfrac{1}{21}$

D. $\dfrac{-1}{21}$

Answer: C

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10. What should be subtracted from $\dfrac{-5}{3}$ to get $\dfrac{5}{6}$?

A. $\dfrac{5}{2}$

B. $\dfrac{3}{2}$

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

D. $\dfrac{-5}{2}$

Answer: D

11. $\left(\dfrac{-3}{7}\right)^{-1} = ?$

A. $\dfrac{7}{3}$

B. $\dfrac{-7}{3}$

C. $\dfrac{3}{7}$

D. none of these

Answer: B

12. The product of two rational numbers is $\dfrac{-28}{81}$. If one of the numbers is $\dfrac{14}{27}$ then the other one is

A. $\dfrac{-2}{3}$

B. $\dfrac{2}{3}$

C. $\dfrac{3}{2}$

D. $\dfrac{-3}{2}$

Answer: A

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13. The product of two numbers is $\dfrac{-16}{35}$. If one of the numbers is $\dfrac{-15}{14}$, the other is

A. $\dfrac{-2}{5}$

B. $\dfrac{8}{15}$

C. $\dfrac{32}{75}$

D. $\dfrac{-8}{3}$

Answer: C

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14. What should be subtracted from $\dfrac{-3}{5}$ to get -2 ?

A. $\dfrac{-7}{5}$

B. $\dfrac{-13}{5}$

C. $\dfrac{13}{5}$

D. $\dfrac{7}{5}$

Answer: D

15. The sum of two rational numbers is -3. If one of them is $\dfrac{-10}{3}$ then the other one is

A. $\dfrac{-13}{3}$

B. $\dfrac{-19}{3}$

C. $\dfrac{1}{3}$

D. $\dfrac{13}{3}$

Answer: C

16. Which of the following numbers is in standard form?

A. $\dfrac{-12}{26}$

B. $\dfrac{-49}{70}$

C. $\dfrac{-9}{16}$

D. $\dfrac{28}{-105}$

Answer: C

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17. $\left(\dfrac{-9}{16} \times \dfrac{8}{15} \right) = ?$

A. $\dfrac{-3}{10}$

B. $\dfrac{-4}{15}$

C. $\dfrac{-9}{25}$

D. $\dfrac{-2}{5}$

Answer: A

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18. $\left(\dfrac{-5}{9} \div \dfrac{2}{3} \right) = ?$

A. $\dfrac{-5}{2}$

B. $\dfrac{-5}{6}$

C. $\dfrac{-10}{27}$

D. $\dfrac{-6}{5}$

Answer: B

19. $\dfrac{4}{9} \div \ ? \ = \dfrac{-8}{15}$

A. $\dfrac{-32}{45}$

B. $\dfrac{-8}{5}$

C. $\dfrac{-9}{10}$

D. $\dfrac{-5}{6}$

Answer: D

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20. Additive inverse of $\dfrac{-5}{9}$ is

A. $\dfrac{-9}{5}$

B. 0

C. $\dfrac{5}{9}$

D. $\dfrac{9}{5}$

Answer: C

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21. Reciprocal of $\dfrac{-3}{4}$ is

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

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

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

D. 0

Answer: C

---

22. A rational number between $\dfrac{-2}{3}$ and $\dfrac{1}{4}$ is

A. $\dfrac{5}{12}$

B. $\dfrac{-5}{12}$

C. $\dfrac{5}{24}$

D. $\dfrac{-5}{24}$

Answer: D

23. The reciprocal of a negative rational number

    A.   is a positive rational number

    B.   is a negative rational number

    C.

        can be either a positive or a negative rational number

    D.   does not exist

Answer: B

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Test Paper

1. Find the additive inverse of: (i) $\dfrac{7}{-10}$ (ii) $\dfrac{8}{5}$

2. The sum of two rational numbers is -4. If one of them is $\dfrac{-11}{5}$, find the other.

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

B. $\dfrac{-4}{5}$

C. $\dfrac{-9}{5}$

D. $\dfrac{-2}{5}$

Answer: C

3. What number should be added to $\dfrac{-3}{5}$ to get $\dfrac{2}{3}$?

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4. What number should be subtracted from $\dfrac{-3}{4}$ to get $\dfrac{-1}{2}$?

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5. Find the multiplicative inverse of : (i) $\dfrac{-3}{4}$ (ii) $\dfrac{11}{4}$

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6. The product of two numbers is -8. If one of them is -12, find the other.

7. Evaluate:

$(i)\dfrac{-3}{5} \times \dfrac{10}{7}$ $(ii)\left(\dfrac{-5}{8}\right)^{-1}$ $(iii)(- 6)^{-1}$

8. Name the property of multiplication shown by each of the following statements:

(i) $\dfrac{-12}{5} \times \dfrac{3}{4} = \dfrac{3}{4} \times \dfrac{-12}{5}$

(ii) $\dfrac{-8}{15} \times 1 = \dfrac{-8}{15}$

(iii) $\left(\dfrac{-2}{3} \times \dfrac{7}{8} \right) \times \dfrac{-5}{7} = \dfrac{-2}{3} \times \left(\dfrac{7}{8} \times \dfrac{-5}{7} \right)$

(iv) $\dfrac{-2}{3} \times 0 = 0$

(v) $\dfrac{2}{5} \times \left(\dfrac{-4}{5} + \dfrac{-3}{10} \right) = \left(\dfrac{2}{5} \times \dfrac{-4}{5} \right) + \left(\dfrac{2}{5} \times \dfrac{-3}{10} \right)$

9. Find two rational numbers laying between $\dfrac{-1}{3}$ and $\dfrac{1}{2}$.

10. What should be added to $\dfrac{-3}{5}$ to get $\dfrac{-1}{3}$?

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

B. $\dfrac{8}{15}$

C. $\dfrac{4}{15}$

D. $\dfrac{2}{5}$

Answer: C

11. What should be subtracted from $\dfrac{-2}{3}$ to get $\dfrac{3}{4}$?

A. $\dfrac{-11}{12}$

B. $\dfrac{-13}{12}$

C. $\dfrac{-5}{4}$

D. $\dfrac{-17}{12}$

Answer: D

12. $\left(\dfrac{-5}{4}\right)^{-1} = \,?$

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

B. $\dfrac{-4}{5}$

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

D. $\dfrac{3}{5}$

Answer: B

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13. The product of two numbers is $\dfrac{-1}{4}$. If one of them is $\dfrac{-3}{10}$, then the other is

A. $\dfrac{5}{6}$

B. $\dfrac{-5}{6}$

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

D. $\dfrac{-8}{5}$

Answer: A

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14. $\left(\dfrac{-5}{6} \div \dfrac{-2}{3} \right) = ?$

A. $\dfrac{-5}{4}$

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

C. $\dfrac{-4}{5}$

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

Answer: B

---

15. Find the value of x . $\dfrac{4}{3} \div x = \dfrac{-5}{2}$

A. $\dfrac{-8}{5}$

B. $\dfrac{8}{5}$

C. $\dfrac{-8}{15}$

D. $\dfrac{8}{15}$

Answer: C

16. Reciprocal of $\dfrac{-7}{9}$ is

A. $\dfrac{9}{7}$

B. $\dfrac{-9}{7}$

C. $\dfrac{7}{9}$

D. none of these

Answer: B

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17. A rational number between $\dfrac{-2}{3}$ and $\dfrac{1}{2}$ is

A. $\dfrac{-1}{6}$

B. $\dfrac{-1}{12}$

C. $\dfrac{-5}{6}$

D. $\dfrac{5}{6}$

Answer: A

18. Fill in the blanks.

(i) $\dfrac{25}{8} \div (\text{.......}) = -10.$

(ii) $\dfrac{-8}{9} \times (\text{.........}) = \dfrac{-2}{3}.$

(iii) $(-1) + (\text{.........}) = \dfrac{-2}{9}$.

(iv) $\dfrac{2}{3} - (\text{.........}) = \dfrac{1}{15}.$

19. Write 'T' for true and 'F' for false for each of the following:

(i) Rational numbers are always closed under subtraction.

(ii) Rational numbers are always closed under division.

(iii) $1 \div 0 = 0$.

(iv) Subtraction is commutative on rational numbers.

(v) $-\left(\dfrac{-7}{8}\right) = \dfrac{7}{8}$.

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