## EXERCISE # 1

By Using property find value of (Q.1 to Q.3)

- Q.1  $-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} \frac{3}{5} \times \frac{1}{6}$
- **Q.2**  $\frac{2}{5} \times \left(-\frac{3}{7}\right) \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$
- **Q.3**  $\frac{5}{7} + \frac{1}{3} + \frac{8}{9} + \frac{1}{14}$
- Q.4 Subtract the first rational number from the second in each of the following:

(i) 
$$\frac{3}{8}, \frac{5}{8}$$
  
(ii)  $\frac{-7}{9}, \frac{4}{9}$   
(iii)  $\frac{-2}{11}, \frac{-9}{11}$   
(iv)  $\frac{11}{13}, \frac{-4}{13}$   
(v)  $\frac{1}{4}, \frac{-3}{8}$   
(vi)  $\frac{-2}{3}, \frac{5}{6}$   
(vii)  $\frac{-6}{7}, \frac{-13}{14}$   
(viii)  $\frac{-8}{33}, \frac{-7}{22}$ 

Q.5 The sum of the two numbers is  $\frac{5}{9}$ . If one of the numbers is  $\frac{1}{3}$ , find the other.

Q.6 The sum of two numbers is 
$$\frac{-1}{3}$$
. If one of the numbers is  $\frac{-12}{3}$ , find the other.

- Q.7 The sum of two numbers is  $\frac{-4}{3}$ . If one of the numbers is -5, find the other.
- Q.8 The sum of two rational numbers is–8. If one of the numbers is  $\frac{-15}{7}$ , find the other.
- **Q.9** What should be added to  $\frac{-7}{8}$  so as to get  $\frac{5}{9}$ ?
- Q.10 What number should be added to  $\frac{-5}{11}$  so as to get  $\frac{26}{33}$ ?
- Q.11 What number should be added to  $\frac{-5}{7}$  to get  $\frac{-2}{3}$ ?

- Q.12 What number should be subtracted from  $\frac{-5}{3}$  to get  $\frac{5}{4}$ ?
- Q.13 What number should be subtracted from  $\frac{3}{7}$  to get  $\frac{5}{4}$ ?
- Q.14 What should be added to  $\left(\frac{2}{3} + \frac{3}{5}\right)$  to get  $\frac{-2}{15}$ ?

Q.15 What should be added to 
$$\left(\frac{1}{2} + \frac{1}{3} + \frac{1}{5}\right)$$
 to get 3?

Q.16 What should be subtracted from  $\left(\frac{3}{4} - \frac{2}{3}\right)$  to get  $\frac{-1}{6}$ ?

Q.17 Simply each of the following and write as a rational number of the from  $\frac{p}{a}$ :

(i) 
$$\frac{3}{4} + \frac{5}{6} + \frac{-7}{8}$$
 (ii)  $\frac{2}{3} + \frac{-5}{6} + \frac{-7}{9}$   
(iii)  $\frac{-11}{2} + \frac{7}{6} + \frac{-5}{8}$  (iv)  $\frac{-4}{5} + \frac{-7}{10} + \frac{-8}{15}$   
(v)  $\frac{-9}{10} + \frac{22}{15} + \frac{13}{-20}$  (vi)  $\frac{5}{3} + \frac{3}{-2} + \frac{-7}{3} + 3$ 

Q.18 Express each of the following as a rational number of the form  $\frac{p}{a}$ :

(i)  $\frac{-8}{3} + \frac{-1}{4} + \frac{-11}{6} + \frac{3}{8} - 3$ (ii)  $\frac{6}{7} + 1 + \frac{-7}{9} + \frac{19}{21} + \frac{-12}{7}$ (iii)  $\frac{15}{2} + \frac{9}{8} + \frac{-11}{3} + 6 + \frac{-7}{6}$ (iv)  $\frac{-7}{4} + 0 + \frac{-9}{5} + \frac{19}{10} + \frac{11}{14}$ (v)  $\frac{-7}{4} + \frac{5}{3} + \frac{-1}{2} + \frac{-5}{6} + 2$ 

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#### Q.19 Simplify:

(i) $\frac{-3}{2} + \frac{5}{4} - \frac{7}{4}$	(ii) $\frac{5}{3} - \frac{7}{6} + \frac{-2}{3}$
(iii) $\frac{5}{4} - \frac{7}{6} - \frac{-2}{3}$	(iv) $\frac{-2}{5} - \frac{-3}{10} - \frac{-4}{7}$
(v) $\frac{5}{6} + \frac{-2}{5} - \frac{-2}{15}$	(vi) $\frac{3}{8} - \frac{-2}{9} + \frac{-5}{36}$

Q.20 Multiply:

(i) $\frac{7}{11}$ by $\frac{5}{4}$	(ii) $\frac{5}{7}$ by $\frac{-3}{4}$
(iii) $\frac{-2}{9}$ by $\frac{5}{11}$	(iv) $\frac{-3}{17}$ by $\frac{-5}{-4}$
(v) $\frac{9}{-7}$ by $\frac{36}{-11}$	(vi) $\frac{-11}{13}$ by $\frac{-21}{7}$
(vii) $-\frac{3}{5}$ by $-\frac{4}{7}$	(viii) $-\frac{15}{11}$ by 7

Q.21 Multiply:

(i) $\frac{-5}{17}$ by $\frac{51}{-60}$	(ii) $\frac{-6}{11}$ by $\frac{-55}{36}$
(iii) $\frac{-8}{25}$ by $\frac{-5}{16}$	(iv) $\frac{6}{7}$ by $\frac{-49}{36}$
(v) $\frac{8}{-9}$ by $\frac{-7}{-16}$	(vi) $\frac{-8}{9}$ by $\frac{3}{64}$

Q.22 Simplify each of the following and express the result as a rational number in standard form:

(i)  $\frac{-16}{21} \times \frac{14}{5}$  (ii)  $\frac{7}{6} \times \frac{-3}{28}$ (iii)  $\frac{-19}{36} \times 16$  (iv)  $\frac{-13}{9} \times \frac{27}{-26}$ 

- (v)  $\frac{-9}{16} \times \frac{-64}{-27}$  (vi)  $\frac{-50}{7} \times \frac{14}{3}$ -11 -81 -5 72
- (vii)  $\frac{-11}{9} \times \frac{-81}{-88}$  (viii)  $\frac{-5}{9} \times \frac{72}{-25}$

Q.23 Simplify:

(i)  $\left(\frac{25}{8} \times \frac{2}{5}\right) - \left(\frac{3}{5} \times \frac{-10}{9}\right)$ (ii)  $\left(\frac{1}{2} \times \frac{1}{4}\right) + \left(\frac{1}{2} \times 6\right)$ (iii)  $\left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right)$ (iv)  $\left(\frac{-9}{4} \times \frac{5}{3}\right) + \left(\frac{13}{2} \times \frac{5}{6}\right)$ (v)  $\left(\frac{-4}{3} \times \frac{12}{-5}\right) + \left(\frac{3}{7} \times \frac{21}{15}\right)$ (vi)  $\left(\frac{13}{5} \times \frac{8}{3}\right) - \left(\frac{-5}{2} \times \frac{11}{3}\right)$ (vii)  $\left(\frac{13}{7} \times \frac{11}{26}\right) - \left(\frac{-4}{3} \times \frac{5}{6}\right)$ (viii)  $\left(\frac{8}{5} \times \frac{-3}{2}\right) + \left(\frac{-3}{10} \times \frac{11}{16}\right)$ 

### **ANSWER KEY**

### **EXERCISE #1**

<b>1.</b> 2 <b>2.</b> $-\frac{11}{28}$	<b>3.</b> $\frac{2}{1}$	253 26			
<b>4.</b> (i) $\frac{1}{4}$ (ii) $\frac{11}{9}$	(iii) $-\frac{7}{11}$ (iv)	$-\frac{15}{13}$ (v) $-\frac{5}{8}$	(vi) $\frac{3}{2}$ (vii) $-\frac{1}{14}$	$(viii) - \frac{5}{66}$	5. $\frac{2}{9}$ 6. $\frac{11}{3}$ 7. $\frac{11}{3}$
<b>8.</b> $-\frac{41}{7}$	9. $\frac{103}{72}$	<b>10.</b> $\frac{41}{32}$	<b>11.</b> $\frac{1}{21}$	<b>12.</b> $\frac{-5}{2}$	<b>13.</b> $\frac{-23}{28}$
<b>14.</b> $\frac{-7}{5}$	<b>15.</b> $\frac{59}{30}$	<b>16.</b> $\frac{1}{4}$			

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## EXERCISE # 2

**Q**.:

- Give examples of Q.1
  - (a) The rational number that does not have a reciprocal.
  - (b) The rational numbers that are equal to their reciprocals.
  - (c) The rational number that is equal to its negative.
- 0.2 Fill in the blanks.

  - (a) Zero has \_\_\_\_\_ reciprocal.(b) The numbers \_\_\_\_\_ and \_\_\_\_\_ are their own reciprocals.
  - (c) The reciprocal of -5 is .
  - (d) Reciprocal of  $\frac{1}{x}$ , where  $x \neq 0$  is\_\_\_\_\_.
  - (e) The product of two rational numbers is always a
  - The reciprocal of a positive rational number (f) is .
- Q.3 Represent these numbers on the number line. (i)  $\frac{7}{4}$ (ii)  $\frac{-5}{6}$
- Represent  $\frac{-2}{11}$ ,  $\frac{-5}{11}$ ,  $\frac{-9}{11}$  on the number line. **Q.4**
- Q.5 Write five rational numbers which are smaller than 2.

Find ten rational numbers between  $\frac{-2}{5}$  and  $\frac{1}{2}$ . **Q.6** 

- Find five rational numbers between. **Q.7** (i)  $\frac{2}{3}$  and  $\frac{4}{5}$  (ii)  $\frac{-3}{2}$  and  $\frac{5}{3}$  (iii)  $\frac{1}{4}$  and  $\frac{1}{2}$
- Write five rational numbers greater than -2. Q.8
- Find ten rational numbers between  $\frac{3}{5}$  and  $\frac{3}{4}$ . Q.9
- What expression to be added to Q.10  $(5x^2 - 7x + 2)$  to produce  $(7x^2 - 1)$ . (A)  $2x^2 + 7x + 3$  (B)  $2x^2 + 7x - 3$ (C)  $12x^2 - 7x + 1$  (D)  $2x^2 - 3$
- Q.11 What must be added to  $1 - x + x^2 - 2x^3$  to obtain  $x^3$ ? (A)  $x^3 - x^2 + x - 1$ (B)  $-1 + x + x^2 - 3x^3$ (C)  $3x^3 - x^2 + x - 1$ (D) None of these

What must be added to the sum of Q.12  $4x^2 + 3x - 7$  and  $3x^2 + 6x + 5$  to get : 1? (A)  $7x^2 + 9x - 3$  (B)  $3 - 9x - 7x^2$ (C)  $7x^2 + 9x - 2$  (D) None of these

By what number should  $\left(\frac{1}{-15}\right)$  be divided Q.13 so that the quotient equal to  $\left(\frac{1}{-5}\right)$ .

Q.14 Simplify each of the following :  
(i) 
$$\left[\left\{\left(\frac{-1}{5}\right)^{-2}\right\}^{2}\right]^{-1}$$
 (ii)  $\left\{\left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3}\right\} \div \left(\frac{1}{4}\right)^{-2}$ 

15 Simplify:  
(i) 
$$\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-5}$$
 (ii)  $\left(\frac{-2}{3}\right)^{-2} \times \left(\frac{4}{5}\right)^{-3}$   
(iii)  $\left(\frac{3}{4}\right)^{-4} \div \left(\frac{3}{2}\right)^{-3}$  (iv)  $\left(\frac{3}{7}\right)^{-2} \times \left(\frac{7}{6}\right)^{-3}$ 

**Q.16** Evaluate : 
$$\frac{8^{-1} \times 5^3}{2^{-4}}$$

Q.17 Simplify:  
(i) 
$$\frac{25 \times a^{-4}}{5^{-3} \times 10 \times a^{-8}}$$
 (ii)  $\frac{3^{-5} \times 10^{-5} \times 125}{5^{-7} \times 6^{-5}}$ 

- By what number should  $(-4)^{-2}$  be multiplied Q.18 so that the product may be equal to  $10^{-2}$ ?
- By what number should  $(-12)^{-1}$  be divided Q.19 so that the quotient may be  $\left(\frac{2}{3}\right)^{-1}$ ?

**Q.20** By what number should 
$$\left(\frac{-3}{2}\right)^{-3}$$
 be divided  
so that the quotient may be  $\left(\frac{4}{27}\right)^{-2}$ ?

**Q.21** Find m so that 
$$\left(\frac{2}{9}\right)^3 \times \left(\frac{2}{9}\right)^{-6} = \left(\frac{2}{9}\right)^{2m-1}$$

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# ANSWER KEY

# EXERCISE # 2

<b>1.</b> (a) 0; (b) 1 and $(-1)$ ; (c) 0
<b>2.</b> (a) No; (b) 1, -1; (c) $\frac{-1}{5}$ ; (d) x; (e) Rational Number; (f) positive
<b>3.</b> (i) $\xrightarrow{1}{0} \frac{1}{4} \frac{2}{4} \frac{3}{4} \frac{4}{4} \frac{5}{5} \frac{6}{6} \frac{7}{4}$ ; (ii) $\xrightarrow{-1}{0} \frac{1}{6} \frac{1}{-6} \frac{-1}{-5} \frac{-1}{-6} \frac{-3}{-5} \frac{-2}{-6} \frac{-1}{-5} \frac{-1}{-6} \frac{-3}{-5} \frac{-3}{-6} \frac{-3}{-$
$4. \underbrace{\begin{array}{c} -1 \\ -11 \\ -11 \\ 11 \\ 11 \\ 11 \\ 11 \\ 1$
5. Some of these are 1, $\frac{1}{2}$ , 0, -1, $\frac{-1}{2}$
6. $\frac{-7}{20}$ , $\frac{-6}{20}$ , $\frac{-5}{20}$ , $\frac{-4}{20}$ , $\frac{-3}{20}$ , $\frac{-2}{20}$ , $\frac{-1}{20}$ , 0,, $\frac{1}{20}$ , $\frac{2}{20}$ (These can be many more such rational numbers)
7. (i) $\frac{41}{60}$ , $\frac{42}{60}$ , $\frac{43}{60}$ , $\frac{44}{60}$ , $\frac{45}{60}$ ; (ii) $\frac{-8}{6}$ , $\frac{-7}{6}$ , 0, $\frac{1}{6}$ , $\frac{2}{6}$ ; (iii) $\frac{9}{32}$ , $\frac{10}{32}$ , $\frac{11}{32}$ , $\frac{12}{32}$ , $\frac{13}{32}$ (There can be many more such rational numbers)
8. $\frac{-3}{2}$ , -1, $\frac{-1}{2}$ , 0, $\frac{1}{2}$ (There can be many more such rational numbers)
9. $\frac{97}{160}$ , $\frac{98}{160}$ , $\frac{99}{160}$ , $\frac{100}{160}$ , $\frac{101}{160}$ , $\frac{102}{160}$ , $\frac{103}{160}$ , $\frac{104}{160}$ , $\frac{105}{160}$ , $\frac{106}{160}$ (There can be many more such rational numbers)
<b>13.</b> $\frac{1}{3}$ <b>14.</b> (i) $\frac{1}{625}$ ; (ii) $\frac{1}{16}$ <b>15.</b> (i) $\frac{64}{25}$ ; (ii) $\frac{1125}{256}$ ; (iii) $\frac{32}{3}$ ; $\frac{24}{7}$
<b>16.</b> 250 <b>17.</b> (i) $\frac{625}{2}a^4$ ; (ii) $5^5$ <b>18</b> . $\frac{4}{25}$
<b>19.</b> $\frac{-1}{18}$ <b>20.</b> $-2 \times \left(\frac{4}{27}\right)^3$ <b>21.</b> m = -1

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