

## EXERCISE 1.4

**Simplify each of the following and write as a rational number of the form p/q:**

**(i)  $\frac{3}{4} + \frac{5}{6} + -\frac{7}{8}$**

**Solution:**

$$\frac{3}{4} + \frac{5}{6} - \frac{7}{8}$$

By taking LCM for 4, 6 and 8 which is 24

$$\frac{((3 \times 6) + (5 \times 4) - (7 \times 3))}{24}$$

$$\frac{(18 + 20 - 21)}{24}$$

$$\frac{(38 - 21)}{24}$$

$$\frac{17}{24}$$

**(ii)  $\frac{2}{3} + -\frac{5}{6} + -\frac{7}{9}$**

**Solution:**

$$\frac{2}{3} + -\frac{5}{6} + -\frac{7}{9}$$

By taking LCM for 3, 6 and 9 which is 18

$$\frac{((2 \times 6) + (-5 \times 3) + (-7 \times 2))}{18}$$

$$\frac{(12 - 15 - 14)}{18}$$

$$-\frac{17}{18}$$

**(iii)  $-\frac{11}{2} + \frac{7}{6} + -\frac{5}{8}$**

**Solution:**

$$-\frac{11}{2} + \frac{7}{6} + -\frac{5}{8}$$

By taking LCM for 2, 6 and 8 which is 24

$$\frac{((-11 \times 12) + (7 \times 4) + (-5 \times 3))}{24}$$

$$\frac{(-132 + 28 - 15)}{24}$$

$$-\frac{119}{24}$$

**(iv)  $-\frac{4}{5} + -\frac{7}{10} + -\frac{8}{15}$**

**Solution:**

$$-\frac{4}{5} + -\frac{7}{10} + -\frac{8}{15}$$

By taking LCM for 5, 10 and 15 which is 30

$$\frac{((-4 \times 6) + (-7 \times 3) + (-8 \times 2))}{30}$$

$$\frac{(-24 - 21 - 16)}{30}$$

$$-\frac{61}{30}$$

**(v)  $-\frac{9}{10} + \frac{22}{15} + \frac{13}{-20}$**

**Solution:**

$$-\frac{9}{10} + \frac{22}{15} + \frac{13}{-20}$$

By taking LCM for 10, 15 and 20 which is 60

$$((-9 \times 6) + (22 \times 4) + (-13 \times 3))/60$$

$$(-54 + 88 - 39)/60$$

$$-5/60 = -1/12$$

**(vi)  $5/3 + 3/-2 + -7/3 + 3$**

**Solution:**

$$5/3 + 3/-2 + -7/3 + 3$$

By taking LCM for 3, 2, 3 and 1 which is 6

$$((5 \times 2) + (-3 \times 3) + (-7 \times 2) + (3 \times 6))/6$$

$$(10 - 9 - 14 + 18)/6$$

$$5/6$$

**2. Express each of the following as a rational number of the form p/q:**

**(i)  $-8/3 + -1/4 + -11/6 + 3/8 - 3$**

**Solution:**

$$-8/3 + -1/4 + -11/6 + 3/8 - 3$$

By taking LCM for 3, 4, 6, 8 and 1 which is 24

$$((-8 \times 8) + (-1 \times 6) + (-11 \times 4) + (3 \times 3) - (3 \times 24))/24$$

$$(-64 - 6 - 44 + 9 - 72)/24$$

$$-177/24$$

Further divide by 3 we get,

$$-177/24 = -59/8$$

**(ii)  $6/7 + 1 + -7/9 + 19/21 + -12/7$**

**Solution:**

$$6/7 + 1 + -7/9 + 19/21 + -12/7$$

By taking LCM for 7, 1, 9, 21 and 7 which is 63

$$((6 \times 9) + (1 \times 63) + (-7 \times 7) + (19 \times 3) + (-12 \times 9))/63$$

$$(54 + 63 - 49 + 57 - 108)/63$$

$$17/63$$

**(iii)  $15/2 + 9/8 + -11/3 + 6 + -7/6$**

**Solution:**

$$15/2 + 9/8 + -11/3 + 6 + -7/6$$

By taking LCM for 2, 8, 3, 1 and 6 which is 24

$$((15 \times 12) + (9 \times 3) + (-11 \times 8) + (6 \times 24) + (-7 \times 4))/24$$

$$(180 + 27 - 88 + 144 - 28)/24$$

$$235/24$$

**(iv)  $-7/4 + 0 + -9/5 + 19/10 + 11/14$**

**Solution:**

$$-7/4 + 0 + -9/5 + 19/10 + 11/14$$

By taking LCM for 4, 5, 10 and 14 which is 140

$$((-7 \times 35) + (-9 \times 28) + (19 \times 14) + (11 \times 10))/140$$

$$(-245 - 252 + 266 + 110)/140$$

$$-121/140$$

**(v)  $-7/4 + 5/3 + -1/2 + -5/6 + 2$**

**Solution:**

$$-7/4 + 5/3 + -1/2 + -5/6 + 2$$

By taking LCM for 4, 3, 2, 6 and 1 which is 12

$$((-7 \times 3) + (5 \times 4) + (-1 \times 6) + (-5 \times 2) + (2 \times 12))/12$$

$$(-21 + 20 - 6 - 10 + 24)/12$$

$$7/12$$

**3. Simplify:**

**(i)  $-3/2 + 5/4 - 7/4$**

**Solution:**

$$-3/2 + 5/4 - 7/4$$

By taking LCM for 2 and 4 which is 4

$$((-3 \times 2) + (5 \times 1) - (7 \times 1))/4$$

$$(-6 + 5 - 7)/4$$

$$-8/4$$

Further divide by 2 we get,

$$-8/2 = -2$$

**(ii)  $5/3 - 7/6 + -2/3$**

**Solution:**

$$5/3 - 7/6 + -2/3$$

By taking LCM for 3 and 6 which is 6

$$((5 \times 2) - (7 \times 1) + (-2 \times 2))/6$$

$$(10 - 7 - 4)/6$$

$$-1/6$$

**(iii)  $5/4 - 7/6 - -2/3$**

**Solution:**

$$5/4 - 7/6 - -2/3$$

By taking LCM for 4, 6 and 3 which is 12

$$\begin{aligned} & ((5 \times 3) - (7 \times 2) - (-2 \times 4)) / 12 \\ & (15 - 14 + 8) / 12 \\ & 9 / 12 \end{aligned}$$

Further can divide by 3 we get,  
 $9/12 = 3/4$

**(iv)  $-2/5 - -3/10 - -4/7$**

**Solution:**

$$-2/5 - -3/10 - -4/7$$

By taking LCM for 5, 10 and 7 which is 70

$$\begin{aligned} & ((-2 \times 14) - (-3 \times 7) - (-4 \times 10)) / 70 \\ & (-28 + 21 + 40) / 70 \\ & 33 / 70 \end{aligned}$$

**(v)  $5/6 + -2/5 - -2/15$**

**Solution:**

$$5/6 + -2/5 - -2/15$$

By taking LCM for 6, 5 and 15 which is 30

$$\begin{aligned} & ((5 \times 5) + (-2 \times 6) - (-2 \times 2)) / 30 \\ & (25 - 12 + 4) / 30 \\ & 17 / 30 \end{aligned}$$

**(vi)  $3/8 - -2/9 + -5/36$**

**Solution:**

$$3/8 - -2/9 + -5/36$$

By taking LCM for 8, 9 and 36 which is 72

$$\begin{aligned} & ((3 \times 9) - (-2 \times 8) + (-5 \times 2)) / 72 \\ & (27 + 16 - 10) / 72 \\ & 33 / 72 \end{aligned}$$

Further can divide by 3 we get,  
 $33/72 = 11/24$

