Exercise 5.3

(1)

(i) $\frac{5}{18} = \frac{10}{36}, \frac{15}{54}, \frac{20}{72}$

(ii) $\frac{10}{13} = \frac{20}{26}, \frac{30}{39}, \frac{40}{52}$

(iii) $\frac{6}{113} = \frac{12}{226}, \frac{18}{339}, \frac{24}{452}$

(iv) $\frac{6}{11} = \frac{12}{22}, \frac{18}{33}, \frac{24}{44}$

(v) $\frac{7}{9} = \frac{14}{18}, \frac{21}{27}, \frac{28}{36}$

(vi) $\frac{5}{12} = \frac{10}{24}, \frac{15}{36}, \frac{20}{48}$

(2)

(i) $\frac{6}{7}, \frac{42}{49}$ $\begin{matrix}6\\7\end{matrix}$ = Yes

(ii) $\frac{7}{16}, \frac{42}{90}$ = No

(iii) $\frac{4}{15}, \frac{16}{225}$ = NO

(iv) $\frac{2}{3}, \frac{4}{9}$ = NO

(3)

(i) Missing number = $\frac{84 \times 18}{27} = 56$

(ii) Missing number = $\frac{2 \times 20}{5} = 8$

(iii) Missing number = $\frac{70 \times 15}{7} = 150$

(iv) Missing number = $\frac{52 \times 15}{60} = 13$

(v) Missing number = $\frac{56 \times 18}{72} = 14$

(vi) Missing number = $\frac{5 \times 84}{35} = 12$

(4) (i) $\frac{343}{392} = \frac{343 \div 49}{392 \div 49} = \frac{7}{8}$

(ii) $\frac{2050}{2132} = \frac{2050 \div 82}{2132 \div 82} = \frac{25}{26}$

(iii) $\frac{91}{195} = \frac{91 \div 13}{195 \div 13} = \frac{7}{15}$

(iv) $\frac{45}{72} = \frac{45 \div 9}{72 \div 9} = \frac{5}{8}$

(v) $\frac{60}{110} = \frac{60 \div 10}{110 \div 10} = \frac{6}{11}$

(vii) $\frac{26}{91} = \frac{26 \div 13}{91 \div 13} = \frac{2}{7}$

(5)

$\frac{49}{9}$ = Yes

$\frac{39}{72}$ = No. $\therefore \frac{39 \div 3}{72 \div 3} = \frac{13}{24}$

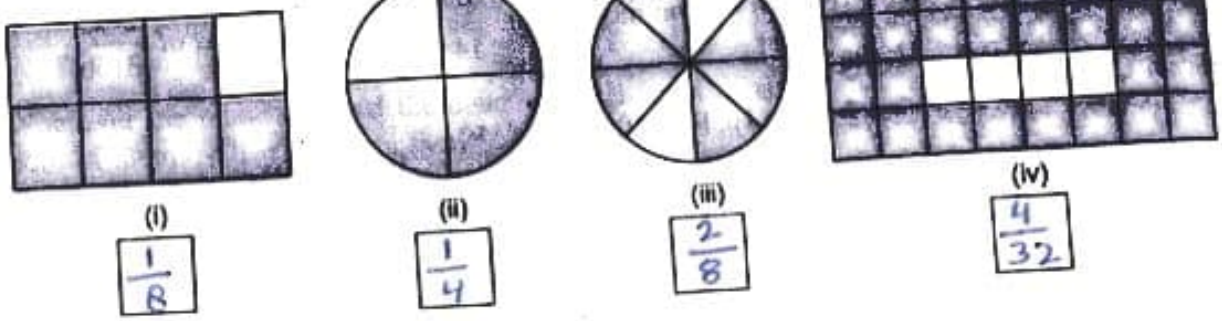
$\frac{85}{136}$ = No. $\therefore \frac{85 \div 17}{136 \div 17} = \frac{5}{8}$

$\frac{76}{361}$ = No. $\therefore \frac{76 \div 19}{361 \div 19} = \frac{4}{19}$

(6) Fraction with numerator 60 = $\frac{4 \times 15}{15 \times 15} = \frac{60}{225}$

(7) Fraction with denominator 35 will equivalent to $\frac{6}{7}$ is $\frac{6\times5}{7\times5} = \frac{30}{35}$

(8) Fractions for unshaded part:



(i) $\frac{1}{8}$ (ii) $\frac{1}{4}$ (iii) $\frac{2}{8}$ (iv) $\frac{4}{32}$

Here,

$\frac{1}{8} = \frac{4}{32} = \frac{1}{8}$

Thus (i) and (iv) are equivalent.

Similarly,

$\frac{1}{4} = \frac{2}{8} = \frac{1}{4}$

Thus, (ii) and (iii) are equivalent.

(9)

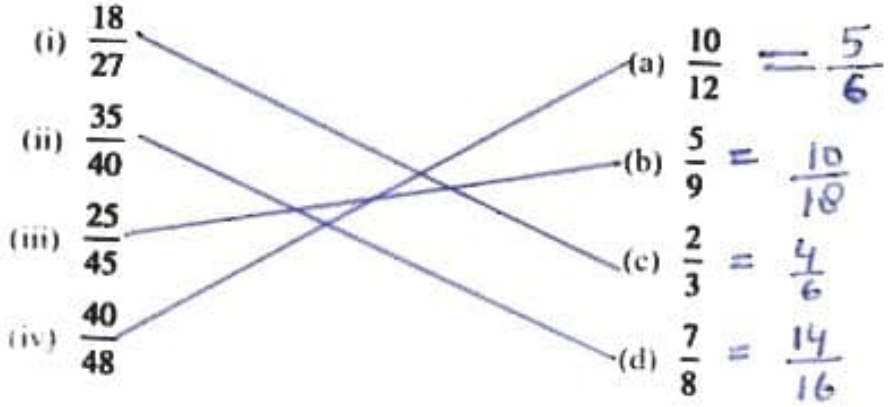
(i) $\frac{2}{5} : \frac{10}{25}\ \frac{2}{5}$

(ii) $\frac{4}{5} : \frac{12}{15}\ \frac{4}{5}$

(iii) $\frac{5}{9}$: $\frac{10}{18} = \frac{5}{9}$

(iv) $\frac{3}{7}$: $\frac{15}{35} = \frac{3}{7}$

10. Match the following and give one more equivalent fraction:



Exercise 5.4

(1)

Proper Fractions: $\frac{1}{7}, \frac{13}{14}, \frac{1}{5}, \frac{7}{10}$

Improper Fractions: $\frac{6}{1}, \frac{3}{2}, \frac{15}{7}, \frac{20}{9}, \frac{100}{77}$

Mixed Fractions: $8\frac{3}{4}, 5\frac{2}{3}, 2\frac{1}{2}$

(2)

8 can be written as $\frac{8}{1}$

10 can be written as $\frac{10}{1}$

15 can be written as $\frac{15}{1}$

These are improper fractions.

(3)

Like fractions are those fractions which have the same denominator.

Thus, $\frac{3}{4}, \frac{9}{4}, \frac{5}{4}$ are like fractions.

(4)

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

$4\frac{2}{15} = \frac{62}{15}$

$\frac{53}{8} = 6\frac{5}{8}$

$8\frac{3}{4} = \frac{35}{4}$

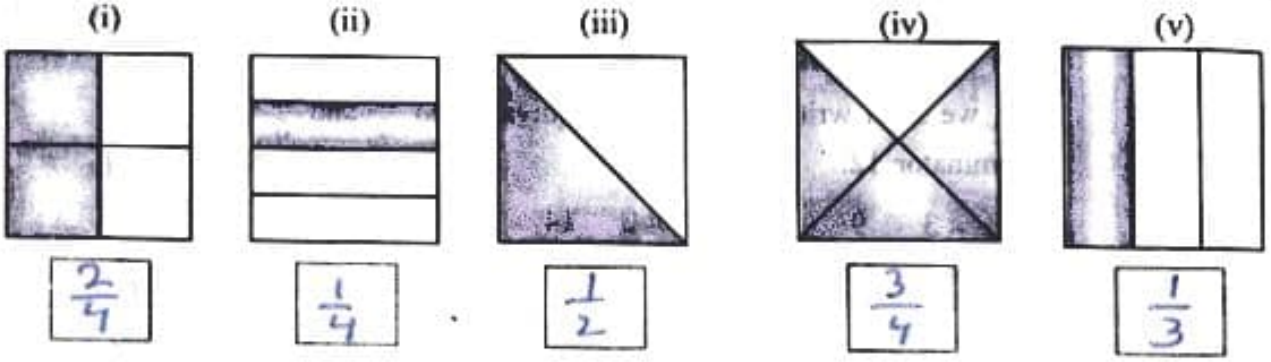
$6\frac{2}{5} = \frac{32}{5}$

$\frac{167}{11} = 15\frac{2}{11}$

$\frac{25}{9} = 2\frac{7}{9}$

$9\frac{5}{8} = \frac{77}{8}$

(5)



$\frac{2}{4}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{3}$

(i), (ii) and (iv) are like fractions.

⑥

(i) $\frac{2}{7}, \frac{5}{7}, \frac{8}{7}, \underline{\frac{11}{7}}, \underline{\frac{14}{7}}$

(ii) $\frac{25}{12}, \frac{21}{12}, \frac{17}{12}, \underline{\frac{13}{12}}, \underline{\frac{9}{12}}$.

⑦

(i) Multiplying the numerator and the denominator of $\frac{7}{9}$ by 4.

Multiplying the numerator and the denominator of $\frac{3}{4}$ by 9.

We have: $\frac{7}{9} \times \frac{4}{4} = \frac{28}{36}$; $\frac{3}{4} \times \frac{9}{9} = \frac{27}{36}$

∴ Required like fractions are $\frac{28}{36}$ and $\frac{27}{36}$.

(ii)

Lcm of 6 and 4 is $2 \times 2 \times 3 = 12$

Now, we shall write the fractions equivalent to $\frac{5}{6}$ and $\frac{3}{4}$ both with denominator 12.

$\frac{5}{6} = \frac{5}{6} \times \frac{2}{2} = \frac{10}{12}$ and $\frac{3}{4} = \frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$

$\therefore$ $\frac{10}{12}$ and $\frac{9}{12}$ are the required like fractions.

(iii)

Multiplying the numerator and denominator of $\frac{5}{11}$ by 5.

Multiplying the numerator and denominator of $\frac{11}{5}$ by 11.

we have,

$\frac{5}{11} \times \frac{5}{5} = \frac{25}{55}$ and $\frac{11}{5} \times \frac{11}{11} = \frac{121}{55}$

$\therefore$ $\frac{25}{55}$ and $\frac{121}{55}$ are the required like fractions.

(iv)

LCM of 6 and 10 is $2 \times 3 \times 5 = 30$.

Now, we shall write the fractions equivalent to $\frac{13}{6}$ and $\frac{9}{10}$ both will denominator 30.

$\frac{13}{6} = \frac{13}{6} \times \frac{5}{5} = \frac{65}{30}$ and $\frac{9}{10} = \frac{9}{10} \times \frac{3}{3} = \frac{27}{30}$

$\therefore$ $\frac{65}{30}$ and $\frac{27}{30}$ are the required like fractions.

(8)

(i) When the numerator is a multiple of the denominator, the fraction represents a whole number.

(ii) In improper fractions, numerator is greater than the denominator

(iii) value of the proper fraction is less than 1.

(iv) Fractions which have 1 as the numerator, are unit fractions.

(v) Like fractions have same denominater.

(9)

Some examples are $\frac{1}{4}, \frac{1}{3}, \frac{3}{4}, \frac{2}{7}, \frac{5}{9}, \frac{2}{9}$

Here $\frac{1}{4}$ and $\frac{3}{4}$ are like fractions as ~~there~~ their numerater is smaller than the denominator.

$\frac{1}{4}$ and $\frac{3}{4}$ are also like fractions as they have the same denominater.

Similarly,

$\frac{5}{9}$ and $\frac{2}{9}$ are proper as well as like fractions.

$\frac{1}{4}, \frac{1}{3}, \frac{2}{7}$ are proper and unlike fractions.

(10) Yes, because every whole number has a denominater 1.

For example $5 = \frac{5}{1}$; $9 = \frac{9}{1}$; $1 = \frac{1}{1}$

Here Numerator $\geq$ Denominator.

Exercise 5.5

(1)

(i) When denominators are same in two fractions, the fraction with the greater numerator is greater.

$\therefore \frac{9}{8} > \frac{5}{8}$

(ii) When denominators are same in two fractions, the fraction with the greater numerater is greater.

$\therefore \frac{30}{6} > \frac{7}{6}$

(iii) $\frac{7}{11}, \frac{3}{22}$

we have $\frac{7}{11}$ and $\frac{3}{22}$

LCM of 11 and 22 is 22.

We shall write the fractions both with denominator 22

$\frac{7}{11} \times \frac{2}{2} = \frac{14}{22}$ and $\frac{3}{22}$

When denominators are same in two fractions the fraction with the greater numerator is greater.

$\therefore \frac{14}{22} > \frac{3}{22}$

Hence $\frac{7}{11} > \frac{3}{22}$

(iv) $\frac{8}{14}$ and $\frac{5}{21}$

Cross multiply

$\frac{8}{14} \times \frac{5}{21}$

Now $8 \times 21 = 168$ and $14 \times 5 = 70$

Since $168 > 70$ so, $\frac{8}{14} > \frac{5}{21}$

(v) We have $\frac{7}{15}$ and $\frac{9}{10}$

Cross multiply $\frac{7}{15} \times \frac{9}{10}$

Now $7 \times 10 = 70$ and $9 \times 15 = 135$

Since $70 < 135$, so $\frac{7}{15} < \frac{9}{10}$.

(vi)

We have $\frac{5}{12}$ and $\frac{7}{8}$

Cross multiply $\frac{5}{12} \times \frac{7}{8}$

Now $5 \times 8 = 40$ and $12 \times 7 = 84$

Since $40 < 84$, so $\frac{5}{12} < \frac{7}{8}$

(2)

(i) $\frac{17}{20} \boxed{>} \frac{4}{5}$

(ii) $3\frac{1}{4} \boxed{=} \frac{13}{4}$

(iii) $\frac{51}{10} \boxed{>} 5$

(iv) $\frac{3}{5} \boxed{<} \frac{5}{3}$

(v) $\frac{15}{19} \boxed{>} \frac{15}{22}$

(vi) $\frac{5}{8} \boxed{>} \frac{5}{16}$

(vii) $\frac{15}{4} \boxed{=} 3\frac{3}{4}$

(viii) $\frac{19}{5} \boxed{=} 3\frac{4}{5}$

(3) $\frac{5}{10}, 0, \frac{30}{25}, \frac{58}{100}, 4\frac{3}{5}$

Changing mixed fraction to improper fraction, we have:

$\frac{5}{10}, 0, \frac{30}{25}, \frac{58}{100}, \frac{23}{5}$

Now, find the Lcm of 10, 25, 100, 5

Lcm of 10, 25, 100 and $5 = 2 \times 2 \times 5 \times 5 = 100$

$\frac{5}{10} = \frac{5}{10} \times \frac{10}{10} = \frac{50}{100}$, $\frac{0}{100}$, $\frac{30}{25} \times \frac{4}{4} = \frac{120}{100}$

$\frac{58}{100}$, $\frac{23}{5} \times \frac{20}{20} = \frac{460}{100}$

Arrange in ascending order, we have

$$\frac{0}{100} < \frac{50}{100} < \frac{58}{100} < \frac{120}{100} < \frac{460}{100}$$

which gives,

$$0 < \frac{5}{10} < \frac{58}{100} < \frac{30}{25} < 4\frac{3}{5}$$

This is the ascending order.

To write in descending order, we reverse the order and get

$$4\frac{3}{5} > \frac{30}{25} > \frac{58}{100} > \frac{5}{10} > 0$$

④ $9\frac{1}{2}$, $7\frac{1}{3}$, $\frac{7}{3}$, $\frac{2}{5}$, $\frac{3}{20}$

changing mixed fraction to improper fraction we have:

$\frac{19}{2}$, $\frac{22}{3}$, $\frac{7}{3}$, $\frac{2}{5}$, $\frac{3}{20}$

Now, find the LCM of 2, 3, 5, 20.

LCM of 2, 3, 5 and 20 = $2 \times 2 \times 3 \times 5 = 60$

$$\frac{19}{2} \times \frac{30}{30} = \frac{570}{60} \quad , \quad \frac{22}{3} \times \frac{20}{20} = \frac{440}{60}$$

$$\frac{7}{3} \times \frac{20}{20} = \frac{140}{60} \quad , \quad \frac{2}{5} \times \frac{6}{6} = \frac{12}{30}$$

$$\frac{3}{20} \times \frac{3}{3} = \frac{9}{60}$$

When denominators are same, the fraction with greater numerator is greater.

Thus,

$\frac{9}{60}$ is the smallest fraction and $\frac{570}{60}$ is the greatest fraction.

$\therefore$ $\frac{3}{20}$ is the smallest and $9\frac{1}{2}$ is the greatest fraction.

(5)

Given that

Cost of 18 pens = ₹56

∴ Cost of 1 pen = $₹\frac{56}{18} = ₹\frac{28}{9}$

Also,

Cost of 8 pens = ₹45

∴ Cost of 1 pen = $₹\frac{45}{8}$

Now, we need to compare, which fraction is greater $\frac{28}{9}$ or $\frac{45}{8}$

cross multiply $\frac{28}{9} \times \frac{45}{8}$

Since $28 \times 8 = 224$ and $45 \times 9 = 405$

$\therefore \frac{28}{9} < \frac{45}{8}$.

Thus, the packet of 8 pens for ₹45 is costlier because $\frac{56}{18} < \frac{45}{8}$.

⑥ Given that,

Class 6 prepared $\frac{5}{6}$ part of the flower bed and class 7 prepared $\frac{7}{8}$ part of the flower bed.

Now we need to find, which fraction is greater.

We have $\frac{5}{6}$ and $\frac{7}{8}$

Cross multiply $\frac{5}{6} \times \frac{7}{8}$

since $8 \times 5 = 40$ and $6 \times 7 = 42$

$\therefore \frac{5}{6} < \frac{7}{8}$

Thus, class VII did better.

⑦ We have $1\frac{3}{4}$ and $1\frac{2}{5}$

Changing mixed fraction to improper fraction we have:

$\frac{7}{4}$ and $\frac{7}{5}$

Cross multiply $\frac{7}{4} \times \frac{7}{5}$

Since $7 \times 5 = 35$ and $4 \times 7 = 28$

$\therefore \frac{7}{4} > \frac{7}{5}$

or $1\frac{3}{4} > 1\frac{2}{5}$

Hence, Rahul spent more time on table tennis.

Exercise 5.6

① Add the following:

(i) $\frac{11}{17} + \frac{40}{17} = \frac{11+40}{17} = \frac{51}{17} = 3$

(ii) $\frac{3}{16} + \frac{5}{16} = \frac{3+5}{16} = \frac{8}{16} = \frac{1}{2}$

(iii) $\frac{2}{15} + \frac{4}{15} = \frac{2+4}{15} = \frac{6}{15} = \frac{2}{5}$

(iv) $\frac{12}{31} + \frac{20}{31} + \frac{5}{31} = \frac{12+20+5}{31} = \frac{37}{31}$ or $1\frac{6}{31}$

(vi) $\frac{73}{101} + \frac{27}{101} + \frac{1}{101} = \frac{73+27+1}{101} = \frac{101}{101} = 1$

(v) $\frac{8}{17} + \frac{5}{17} + \frac{6}{17} = \frac{8+5+6}{17} = \frac{19}{17}$ or $1\frac{2}{17}$

②

(i) $\frac{2}{19} + \frac{\boxed{5}}{19} + \frac{7}{19} = \frac{14}{19}$

(ii) $\frac{15}{32} + \frac{3}{32} + \boxed{9} = \frac{27}{32}$

(3) $\frac{7}{15} + 1\frac{4}{15} + \frac{8}{15}$

Changing mixed fraction to improper fraction, we have:

$$\frac{7}{15} + \frac{19}{15} + \frac{8}{15} = \frac{7+19+8}{15} = \frac{34}{15} \text{ or } 2\frac{4}{15}$$

(4)

(i) $7\frac{1}{3}$ and $4\frac{5}{12}$

$$7\frac{1}{3} + 4\frac{5}{12} = \frac{22}{3} + \frac{53}{12}$$

Lcm of 3 and 12 = 12

∴ we have $\frac{22}{3} \times \frac{4}{4} = \frac{88}{12}$

Thus $\frac{88}{12} + \frac{53}{12} = \frac{141}{12} = 11\frac{9}{12} = 11\frac{3}{4}$

(ii) $\frac{8}{9}$ and $15\frac{2}{3}$

$$\frac{8}{9} + \frac{47}{3} = \frac{8+141}{9} \quad (\because \text{Lcm of } 3 \text{ and } 9 \text{ is } 9)$$

$$= \frac{149}{9} = 16\frac{5}{9}$$

(iii) $5\frac{1}{2}$ and $\frac{2}{3}$

$$5\frac{1}{2} + \frac{2}{3} = \frac{11}{2} + \frac{2}{3}$$

Lcm of 2 and 3 is 6.

$\therefore$ we have

$$\frac{11}{2} + \frac{2}{3} = \frac{33+4}{6} = \frac{37}{6} = 6\frac{1}{6}$$

(iv) $7\frac{2}{5}$ and $1\frac{3}{10}$

$$7\frac{2}{5} + 1\frac{3}{10} = \frac{37}{5} + \frac{13}{10}$$

Lcm of 5 and 10 is 10

$\therefore$ we have

$$\frac{37}{5} + \frac{13}{10} = \frac{74+13}{10} = \frac{87}{10} = 8\frac{7}{10}$$

(5)

(i) $3\frac{1}{2} + \frac{4}{9}$

$= \frac{7}{2} + \frac{4}{9}$

Lcm of 2 and 9 is 18.

∴ we have

$$\frac{7}{2} + \frac{4}{9} = \frac{63+8}{18} = \frac{71}{18} = 3\frac{17}{18}$$

(ii) $\frac{8}{15} + \frac{101}{15} = \frac{8+101}{15} = \frac{109}{15} = 7\frac{4}{15}$

(iii) $\frac{7}{8} + \frac{6}{11}$

Lcm of 8 and 11 is 88.

∴ we have

$$\frac{7}{8} + \frac{6}{11} = \frac{77+48}{88} = \frac{125}{88} = 1\frac{37}{88}$$

(iv) $\frac{14}{25} + \frac{37}{50}$

Lcm of 25 and 50 is 50.

$$\frac{14}{25} + \frac{37}{50} = \frac{28+37}{50} = \frac{65}{50} = \frac{13}{10} = 1\frac{3}{10}$$

(v) $2\frac{11}{100} + 3\frac{21}{25}$

Changing mixed fraction to improper fraction we get:

$$\frac{211}{100} + \frac{96}{25}$$

Lcm of 100 and 25 is 100.

∴ we have $\frac{21}{100} + \frac{96}{25} = \frac{211+384}{100}$

$$= \frac{595}{100} = \frac{119}{20} = 5\frac{19}{20}$$

(vi) $1\frac{7}{12} + 2\frac{5}{16}$

Changing mixed fraction to improper fraction we get:

$$\frac{19}{12} + \frac{37}{16}$$