Class - 6 Ch - 6 Exercise - 6.3

Question 1.

State which of the following fractions are proper, improper or mixed:

(i) $\dfrac{15}{26}$

(ii) $\dfrac{17}{12}$

(iii) $5\dfrac{2}{3}$

(iv) $\dfrac{6}{8}$

(v) $11\dfrac{5}{7}$

(vi) $\dfrac{117}{8}$

(vii) $\dfrac{222}{333}$

(viii) $\dfrac{531}{247}$

Solution:

(i) $\dfrac{15}{26}$ = Proper

(ii) $\dfrac{17}{12}$ = improper

(iii) $5\dfrac{2}{3}$ = Mixed

(iv) $\dfrac{6}{8}$ = Proper

(v) $11\dfrac{5}{7}$ = Mixed

(vi) $\dfrac{117}{8}$ = Improper

(vii) $\dfrac{222}{333}$ = Proper

(viii) $\dfrac{531}{247}$ = improper

Question 2.

Convert the following improper fractions into mixed numbers:

(i) $\dfrac{17}{3}$

(ii) $\dfrac{119}{15}$

(iii) $\dfrac{961}{13}$

(iv) $\dfrac{117}{32}$

Solution:

(i) $\dfrac{17}{3} = 5\dfrac{2}{3}$

(ii) $\dfrac{119}{15} = 7\dfrac{14}{15}$

(iii) $\dfrac{961}{13} = 73\dfrac{12}{13}$

(iv) $\dfrac{117}{32} = 3\dfrac{21}{32}$

Question 3.

Convert the following mixed number into improper fractions:

(i) $7\dfrac{2}{11}$

(ii) $3\dfrac{5}{48}$

(iii) $13\dfrac{7}{64}$

(iv) $7\dfrac{2}{3}$

Solution:

(i) $7\dfrac{2}{11} = \dfrac{11 \times 7 + 2}{11} = \dfrac{79}{11}$

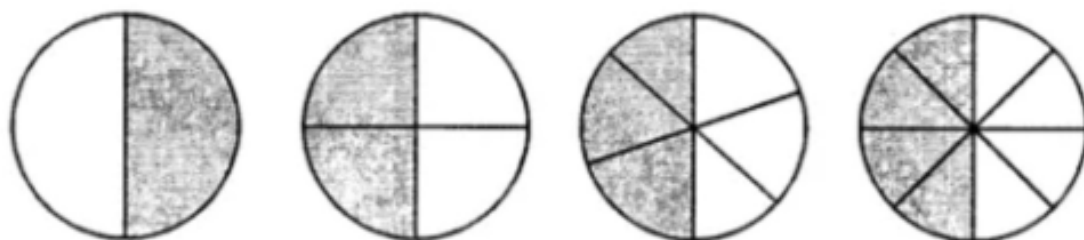(ii) $3\dfrac{5}{48} = \dfrac{48 \times 3 + 5}{48} = \dfrac{149}{48}$

(iii) $13\dfrac{7}{64} = \dfrac{64 \times 13 + 7}{64} = \dfrac{832 + 7}{64} = \dfrac{839}{64}$

(iv) $7\dfrac{2}{3} = \left(7\dfrac{2}{3}\right) = \left(\dfrac{3 \times 7 + 2}{3}\right) = \dfrac{23}{3}$
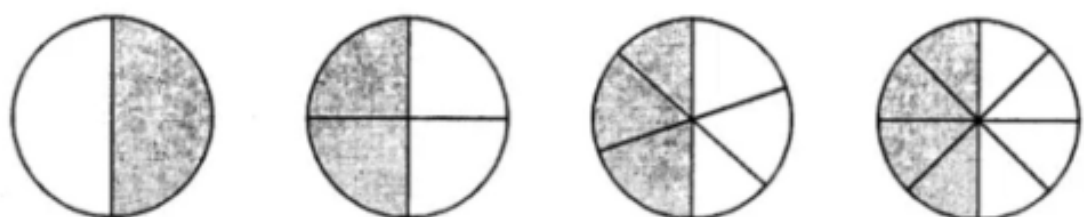
Question 4.

Write the fractions representing the shaded regions.

Are all these fractions equivalent?

Solution:

$$\frac{1}{2} \qquad \frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2} \qquad \frac{3}{6} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2} \qquad \frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$$
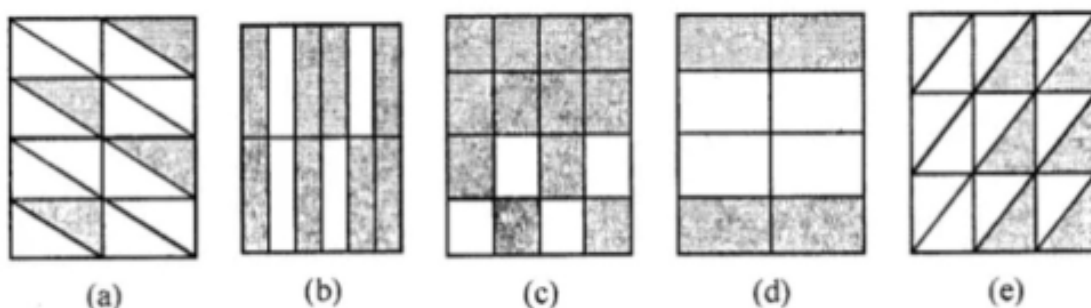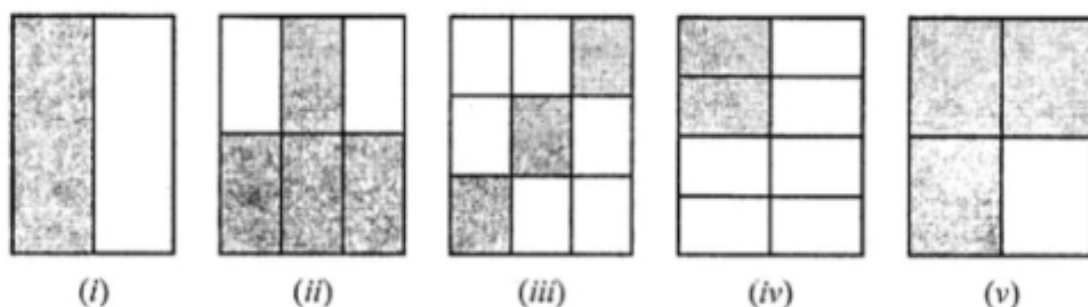
Yes, all the fractions are equivalent.

Question 5.

Write the fractions representing the shaded regions
and pair up the equivalent fractions from each row:

(i) (ii) (iii) (iv) (v)

(a) (b) (c) (d) (e)

Solution:

(i) $\frac{1}{2}$

(ii) $\frac{4}{6} \Rightarrow \frac{2}{3}$

(iii) $\frac{3}{9} \Rightarrow \frac{1}{3}$

(iv) $\frac{2}{8} \Rightarrow \frac{1}{4}$

(v) $\frac{3}{4}$

(a) $\frac{4}{16} \Rightarrow \frac{1}{4}$

(b) $\frac{8}{12} \Rightarrow \frac{2}{3}$

(c) $\frac{12}{16} \Rightarrow \frac{3}{4}$

(d) $\frac{4}{8} \Rightarrow \frac{1}{2}$

(e) $\frac{6}{18} \Rightarrow \frac{1}{3}$

Equivalent fractions are:

(i) ↔ (d)

(ii) ↔ (b)

(iii) ↔ (e)

(iv) ↔ (a)

(v) ↔ (c)

Question 6.

(i) Find the equivalent fraction of $\frac{15}{35}$ with denominator 7.

(ii) Find the equivalent fraction of $\frac{2}{9}$ with denominator 63.

Solution:

(i) $\frac{15}{35} = \frac{\ldots}{7}$

Let the numerator be a

$\Rightarrow 15 \times 7 = 35 \times a$

$a = \frac{15 \times 7}{35}$

$\Rightarrow a = 3$

$\therefore \frac{15}{35} = \frac{3}{7}$

(ii) $\frac{2}{9} = \frac{\dots}{63}$

Let the numerator, which needs to be calculated as x

$\Rightarrow 2 \times 63 = 9 \times x$

$\Rightarrow x = \frac{2 \times 63}{9}$

$\Rightarrow x = 14$

$\therefore \frac{2}{9} = \frac{14}{63}$

Question 7.

Find the equivalent fraction of $\frac{3}{5}$ having

(i) denominator 30

(ii) numerator 27.

Solution:

(i) $\frac{3}{5}$ having denominator 30

Multiply and divide the fraction by 6, we get

$\frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$

(ii) $\frac{3}{5}$ having numerator 27

Multiply and divide the fraction by 9, we get

$\frac{3}{5} \times \frac{9}{9} = \frac{27}{45}$

Question 8.

Replace '.....' in each of the following by the correct number.

(i) $\dfrac{2}{3} = \dfrac{...}{15}$

(ii) $\dfrac{7}{18} = \dfrac{42}{...}$

(iii) $\dfrac{4}{...} = \dfrac{12}{15}$

(iv) $\dfrac{...}{11} = \dfrac{70}{154}$

Solution:

(i) $\dfrac{2}{3} = \dfrac{2 \times 5}{3 \times 5} = \dfrac{10}{15}$

Hence '...' is replaced by 10

(ii) $\dfrac{7}{18} = \dfrac{7 \times 6}{18 \times 6} = \dfrac{42}{108}$

Hence '...' is replaced by 108

(iii) $\dfrac{4}{5} = \dfrac{4 \times 3}{5 \times 3} = \dfrac{12}{15}$

Hence '...' is replaced by 5

(iv) $\dfrac{5}{11} = \dfrac{5 \times 14}{11 \times 14} = \dfrac{70}{154}$

Hence '...' is replaced by 5

Question 9.

Check whether the given pairs of fractions are equivalent:

(i) $\dfrac{3}{10}, \dfrac{12}{40}$

(ii) $\dfrac{5}{8}, \dfrac{30}{48}$

(iii) $\dfrac{4}{6}, \dfrac{30}{20}$

(iv) $\dfrac{7}{13}, \dfrac{5}{11}$

Solution:

(i) $\dfrac{3}{10}, \dfrac{12}{40}$

$$= 3 \times 40 = 120$$
$$= 10 \times 12 = 120$$
$$120 = 120$$

∴ The given fractions $\dfrac{3}{10}$ and $\dfrac{12}{40}$ are equivalent.

(ii) $\dfrac{5}{8}, \dfrac{30}{48}$

$$= 5 \times 48 = 240$$
$$= 30 \times 8 = 240$$
$$240 = 240$$

∴ The given fractions $\dfrac{5}{8}$ and $\dfrac{30}{48}$ are equivalent.

(iii) $\dfrac{4}{6}, \dfrac{30}{20}$

$$= 4 \times 20 = 80$$
$$= 6 \times 30 = 180$$
$$80 \neq 180$$

∴ The given fractions $\dfrac{4}{6}$ and $\dfrac{30}{20}$ are not equivalent.

(iv) $\dfrac{7}{13}, \dfrac{5}{11}$

$$= 7 \times 11 = 77$$
$$= 5 \times 13 = 65$$
$$77 \neq 65$$

∴ The given fractions $\dfrac{7}{13}$ and $\dfrac{5}{11}$ are not equivalent.

Question 10.

Reduce the following fractions to simplest form:

(i) $\dfrac{12}{27}$

(ii) $\dfrac{150}{350}$

(iii) $\dfrac{18}{81}$.

(iv) $\dfrac{276}{115}$

Solution:

(i) $\dfrac{12}{27} = \dfrac{12 \div 3}{27 \div 3} = \dfrac{4}{9}$

(ii) $\dfrac{150}{350} = \dfrac{150 \div 50}{350 \div 50} = \dfrac{3}{7}$

(iii) $\dfrac{18}{81} = \dfrac{18 \div 9}{81 \div 9} = \dfrac{2}{9}$

(iv) $\dfrac{276}{115} = \dfrac{276 \div 23}{115 \div 23} = \dfrac{12}{5}$

Question 11.

Convert the following fractions into equivalent like fractions:

(i) $\dfrac{7}{8}, \dfrac{5}{14}$

(ii) $\dfrac{5}{6}, \dfrac{7}{16}$

(iii) $\dfrac{3}{4}, \dfrac{5}{6}, \dfrac{7}{8}$

Solution:

(i) $\dfrac{7}{8}, \dfrac{5}{14}$

The LCM of 8 and 14

$$
\begin{array}{r|l}
2 & 8,\ 14 \\
\hline
2 & 4,\ 7 \\
\hline
2 & 2,\ 7 \\
\hline
7 & 1,\ 7 \\
\hline
& 1,\ 1
\end{array}
$$

$= 2 \times 2 \times 2 \times 7 = 56$

To write $\dfrac{7}{8}$ with denominator 56, multiply the numerator and denominator by 7

$$= \dfrac{7 \times 7}{8 \times 7} = \dfrac{49}{56}$$

Similarly, $\dfrac{5}{14} = \dfrac{5 \times 4}{14 \times 4} = \dfrac{20}{56}$

Thus, $\dfrac{7}{8}, \dfrac{5}{14}$ can be written as $\dfrac{49}{56}$ and

$\dfrac{20}{56}$ respectively which are equivalent like fractions.

(ii) $\dfrac{5}{6}, \dfrac{7}{16}$

The LCM of 6 and 16

$$
\begin{array}{c|c}
2 & 6, 16 \\
\hline
2 & 3, 8 \\
\hline
2 & 3, 4 \\
\hline
2 & 3, 2 \\
\hline
3 & 3, 1 \\
\hline
 & 1, 1
\end{array}
$$

$= 2 \times 2 \times 2 \times 2 \times 3 = 48$

To write $\dfrac{5}{6}$ with denominator 48, multiply the numerator and denominator by 8

$= \dfrac{5 \times 8}{6 \times 8} = \dfrac{40}{48}$

Similarly, $\dfrac{7}{16} \Rightarrow \dfrac{7 \times 3}{16 \times 3} = \dfrac{21}{48}$

Thus $\dfrac{5}{6}, \dfrac{7}{16}$ can be written as $\dfrac{40}{48}, \dfrac{21}{48}$ respectively with equivalent like fractions.

(iii) $\dfrac{3}{4}$, $\dfrac{5}{6}$, $\dfrac{7}{8}$

The LCM of 4, 6 and 8

$$
\begin{array}{c|ccc}
2 & 4, & 6, & 8 \\
\hline
2 & 2, & 3, & 4 \\
\hline
2 & 1, & 3, & 2 \\
\hline
3 & 1, & 3, & 1 \\
\hline
& 1, & 1, & 1
\end{array}
$$

$= 2 \times 2 \times 2 \times 3 = 24$

To write $\dfrac{3}{4}$ with denominator $= 24$ we need

to multiply numerator and denominator by 6

$$= \dfrac{3}{4} \times \dfrac{6}{6} = \dfrac{18}{24}$$

Similarly $\dfrac{5}{6}$ and $\dfrac{7}{8}$ can be written as

$\dfrac{5}{6} \times \dfrac{4}{4} = \dfrac{20}{24}$ and $\dfrac{7}{8} \times \dfrac{3}{3} = \dfrac{21}{24}$

Hence, $\dfrac{3}{4}$, $\dfrac{5}{6}$, $\dfrac{7}{8}$ can be written as $\dfrac{18}{24}$,

$\dfrac{20}{24}$, $\dfrac{21}{24}$ respectively.

Which are equivalent like terms.