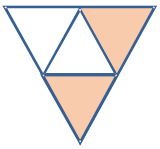
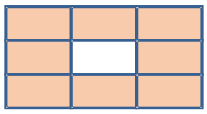
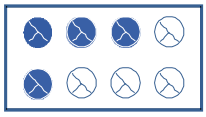
NCERT QUESTIONS WITH SOLUTIONS

EXERCISE : 7.1

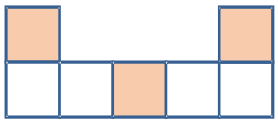
1. Write the fraction representing the shaded portion.

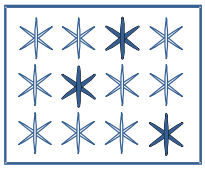
(i) 

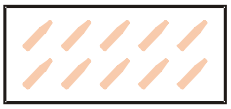
(ii) 

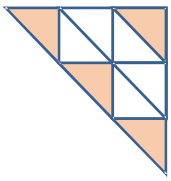
(iii) 

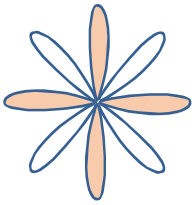
(iv) 

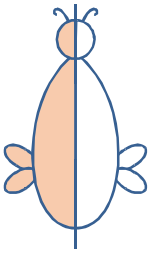
(v) 

(vi) 

(vii) 

(viii) 

(ix) 

(x) 

Sol. (i) The given figure represents 2 shaded parts out of 4 equal parts.

Hence, $\frac{2}{4} = \frac{1}{2}$

(ii) The given figure represents 8 shaded parts out of 9 equal parts.

Hence, $\frac{8}{9}$

(iii) The given figure represents 4 shaded parts out of 8 equal parts.

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

(iv) The given figure represents 1 shaded part out of 4 equal parts.

Hence, $\frac{1}{4}$

(v) The given figure represents 3 shaded parts out of 7 equal parts.

Hence, $\frac{3}{7}$

(vi) The given figure represents 3 shaded parts out of 12 equal parts.

Hence, $\frac{3}{12} = \frac{1}{4}$

(vii) The given figure represents 10 shaded parts out of 10 equal parts

Hence, $\frac{10}{10}$

(viii) The given figure represents 4 shaded parts out of 9 equal parts.

Hence, $\frac{4}{9}$

(ix) The given figure represents 4 shaded parts out of 8 equal parts.

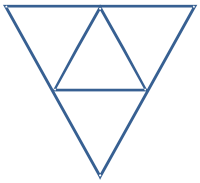
Hence, $\frac{4}{8} = \frac{1}{2}$

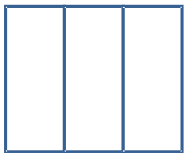
(x) The given figure represents 1 shaded part out of 2 equal parts.

Hence, $\frac{1}{2}$

2. Colour the part according to the given fraction.

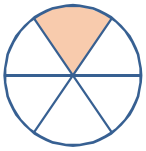
(i) $\frac{1}{6}$ 

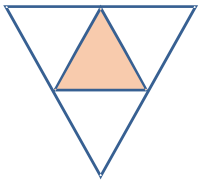
(ii) $\frac{1}{4}$ 

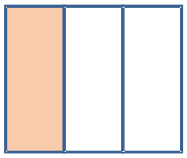
(iii) $\frac{1}{3}$ 

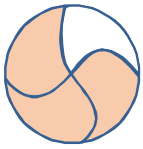
(iv) $\frac{3}{4}$ 

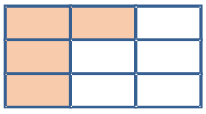
(v) $\frac{4}{9}$ 

Sol. (i) 

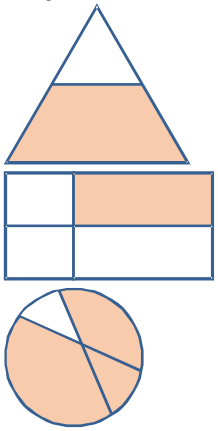
(ii) 

(iii) 

(iv) 

(v) 

3. Identify the error if any.



This is $\frac{1}{2}$

This is $\frac{1}{4}$

This is $\frac{3}{4}$

Sol. The given figures do not represent the fractions as here each shape is not divided in equal parts.

4. What fraction of a day is 8 hours?

Sol. There are 24 hours in a day. Therefore, 8 hours of a day represent $\frac{8}{24} = \frac{1}{3}$

5. What fraction of an hour is 40 minutes?

Sol. There are 60 minutes in an hour. Therefore, 40 minutes of an hour represent $\frac{40}{60} = \frac{4}{6} = \frac{2}{3}$

6. Arya, Abhimanyu, and Vivek shared lunch. Arya has brought two sandwiches, one made of vegetable and one of jam. The other two boys forgot to bring their lunch. Arya agreed to share his sandwiches so that each person will have an equal share of each sandwich.

(a) How can Arya divide his sandwiches so that each person has an equal share?

(b) What part of a sandwich will each boy receive?

Sol. (a) Arya will divide each sandwich in three equal parts. Then, he will give one part of each sandwich to each one of them.

(b) Each boy will receive $\frac{1}{3}$ part of each sandwich.

7. Kanchan dyes dresses. She had to dye 30 dresses. She has so far finished 20 dresses. What fraction of dresses has she finished?

Sol. Dress dyed so far = 20

Total dresses = 30

Fraction = $\frac{20}{30} = \frac{2}{3}$

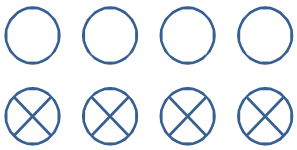
8. Write the natural numbers from 2 to 12. What fraction of them are prime numbers?

Sol. Natural numbers from 2 to 12 are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12. Prime numbers among these are 2, 3, 5, 7, and 11.
Therefore, out of 11 numbers, 5 are prime numbers. It represents a fraction $\frac{5}{11}$.

9. Write the natural numbers from 102 to 113. What fraction of them are prime numbers?

Sol. Natural numbers from 102 to 113 are 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113
Among these numbers, the prime numbers are 103, 107, 109, and 113.
Therefore, out of 12 numbers, 4 are prime numbers. It represents a fraction $\frac{4}{12}=\frac{1}{3}$.

10. What fractions of these circles have X's in them?



Sol. There are 4 circles, out of 8, having X's in them. Therefore, it represents a fraction = $\frac{4}{8}=\frac{1}{2}$.

11. Kristin received a CD player for her birthday. She bought 3 CDs and received 5 others as gifts. What fraction of her total CDs did she buy and what fraction did she receive as gifts?

Sol. Total CDs Kristin had on her birthday = 3 + 5 = 8
Out of 8 CDs, she bought 3 CDs and also got 5 CDs as gifts. Therefore, she bought and received CDs as gifts in a fraction of and respectively.

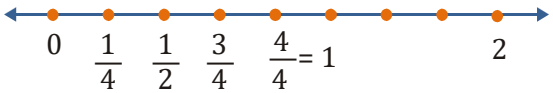
EXERCISE : 7.2

1. Draw number lines and locate the points on them:

(a) $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{4}{4}$ (b) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{7}{8}$

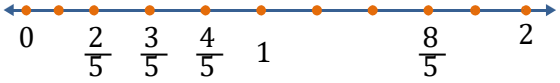
(c) $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$

Sol. (a) $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{4}{4}$



(b) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{7}{8}$

(c) $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$



2. Express the following as mixed fractions

(a) $\frac{20}{3}$ (b) $\frac{11}{5}$

(c) $\frac{17}{7}$ (d) $\frac{28}{5}$

(e) $\frac{19}{6}$ (f) $\frac{35}{9}$

Sol. (a) $\frac{20}{3}=\frac{18+2}{3}=\frac{18}{3}+\frac{2}{3}=6+\frac{2}{3}=6\frac{2}{3}$

(b) $\frac{11}{5}=\frac{10+1}{5}=\frac{10}{5}+\frac{1}{5}=2+\frac{1}{5}=2\frac{1}{5}$

(c) $\frac{17}{7}=\frac{14+3}{7}=\frac{14}{7}+\frac{3}{7}=2+\frac{3}{7}=2\frac{3}{7}$

(d) $\frac{28}{5}=\frac{25+3}{5}=\frac{25}{5}+\frac{3}{5}=5+\frac{3}{5}=5\frac{3}{5}$

(e) $\frac{19}{6}=\frac{18+1}{6}=\frac{18}{6}+\frac{1}{6}=3+\frac{1}{6}=3\frac{1}{6}$

(f) $\frac{35}{9}=\frac{27+8}{9}=\frac{27}{9}+\frac{8}{9}=3+\frac{8}{9}=3\frac{8}{9}$

3. Express the following as improper fractions :

(a) $7\frac{3}{4}$ (b) $5\frac{6}{7}$

(c) $2\frac{5}{6}$ (d) $10\frac{3}{5}$

(e) $9\frac{3}{7}$ (f) $8\frac{4}{9}$

Sol. (a) $7\frac{3}{4}=\frac{(4\times7)+3}{4}=\frac{31}{4}$

(b) $5\frac{6}{7}=\frac{(7\times5)+6}{6}=\frac{41}{7}$

(c) $2\frac{5}{6}=\frac{(6\times2)+5}{6}=\frac{17}{6}$

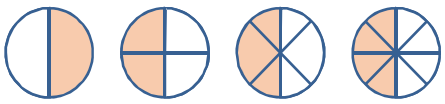
(d) $10\frac{3}{5}=\frac{(5\times10)+3}{5}=\frac{53}{5}$

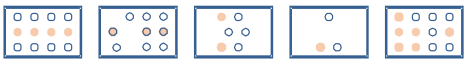
(e) $9\frac{3}{7}=\frac{(7\times9)+3}{7}=\frac{66}{7}$

(f) $8\frac{4}{9}=\frac{(8\times9)+4}{9}=\frac{76}{9}$

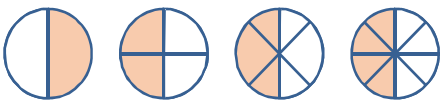
EXERCISE : 7.3

1. Write the fractions. Are all these fractions equivalent?

(a) 

(b) 

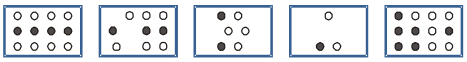
Sol. (a) In the given circles, 1 out of 2, 2 out of 4, 3 out of 6, and 4 out of 8 equal parts are shaded respectively. Therefore, these circles represent



$\frac{1}{2}$ $\frac{2}{4}=\frac{1}{2}$ $\frac{3}{6}=\frac{1}{2}$ $\frac{4}{8}=\frac{1}{2}$

Also, all these fractions are equivalent.

(b) In the given rectangles, 4 out of 12, 3 out of 9, 2 out of 6, 1 out of 3, and 6 out of 12 equal parts (i.e., circles) are shaded respectively. Therefore, these rectangles represent



$\frac{4}{12}=\frac{1}{3}$ $\frac{3}{9}=\frac{1}{3}$ $\frac{2}{6}=\frac{1}{3}$ $\frac{1}{3}$ $\frac{6}{12}=\frac{1}{2}$

No, not all of these fractions are equivalent.

2. Write the fractions and pair up the equivalent fractions from each row.

(a) 

(b) 

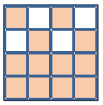
(c) 

(d) 

(e) 

(i) 

(ii) 

(iii) 

(iv) 

(v) 

Sol. (a) Here, 1 part is shaded out of 2 equal parts (i.e., rectangle). Hence, this figure represents a fraction $\frac{1}{2}$.

(b) Here, 4 parts are shaded out of 6 equal parts (i.e., rectangle). Hence, this figure represents a fraction $\frac{4}{6}=\frac{2}{3}$.

(c) Here, 3 parts are shaded out of 9 equal parts (i.e., squares). Hence, this figure represents a fraction $\frac{3}{9}=\frac{1}{3}$.

(d) Here, 2 parts are shaded out of 8 equal parts (i.e., rectangle). Hence, this figure represents a fraction $\frac{2}{8}=\frac{1}{4}$.

(e) Here, 3 parts are shaded out of 4 equal parts (i.e., squares). Hence, this figure represents a fraction $\frac{3}{4}$.

(i) Here, 6 parts are shaded out of 18 equal parts (i.e., triangles). Hence, this figure represents a fraction $\frac{6}{18}=\frac{1}{3}$.

(ii) Here, 4 parts are shaded out of 8 equal parts (i.e., rectangles). Hence, this figure represents a fraction $\frac{4}{8}=\frac{1}{2}$.

(iii) Here, 12 parts are shaded out of 16 equal parts (i.e., squares). Hence, this figure represents a fraction $\frac{12}{16}=\frac{3}{4}$.

(iv) Here, 8 parts are shaded out of 12 equal parts (i.e., rectangles). Hence, this figure represents a fraction $\frac{8}{12}=\frac{2}{3}$.

(v) Here, 4 parts are shaded out of 16 equal parts (i.e., triangles). Hence, this figure represents a fraction $\frac{4}{16}=\frac{1}{4}$.

Now, these figures can be matched correctly as

(a) →(ii); (b)→ (iv); (c) → (i); (d)→ (v); (e) →(iii)

3. Replace $\square$ in each of the following by the correct number :

(a) $\frac{2}{7}=\frac{8}{\square}$ (b) $\frac{5}{8}=\frac{10}{\square}$

(c) $\frac{3}{5}=\frac{\square}{20}$ (d) $\frac{45}{60}=\frac{15}{\square}$

(e) $\frac{18}{24}=\frac{\square}{4}$

Sol. (a) $\frac{2}{7}=\frac{8}{\square}$

$\frac{2}{7}\times\frac{4}{4}=\frac{8}{28}$

Hence, $\square$ can be replaced by 28.

(b) $\frac{5}{8}=\frac{10}{\square}$

$\frac{5}{8}\times\frac{2}{2}=\frac{10}{16}$

Hence, $\square$ can be replaced by 16.

(c) $\frac{3}{5}=\frac{\square}{20}$

$\frac{3}{5}\times\frac{4}{4}=\frac{12}{20}$

Hence, $\square$ can be replaced by 12.

(d) $\frac{45}{60}=\frac{15}{\square}$

$\frac{45}{60}=\frac{15}{20}\times\frac{3}{3}$

Hence, $\square$ can be replaced by 20.

(e) $\frac{18}{24}=\frac{\square}{4}$

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

Hence, $\square$ can be replaced by 3.

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

(a) denominator 20 (b) numerator 9

(c) denominator 30 (d) numerator 27

Sol. (a) $\frac{3}{5}=\frac{\square}{20}$

$3\times 20=5\times\square$

$3\times2\times2\times5=5\times\square$

$12=\square$

Hence, the required fraction is $\frac{12}{20}$.

(b) $\frac{3}{5}=\frac{9}{\square}$

$3 \times \square = 5 \times 9$

$3 \times \square = 5 \times 3 \times 3$

$\square = 15$

Hence, the required fraction is $\frac{9}{15}$.

(c) $\frac{3}{5}=\frac{\square}{30}$

$3 \times 30 = 5 \times \square$

$3 \times 2 \times 3 \times 5 = 5 \times \square$

$18 = \square$

Hence, the required fraction is $\frac{18}{30}$.

(d) $\frac{3}{5}=\frac{27}{\square}$

$3 \times \square = 5 \times 27$

$3 \times \square = 5 \times 3 \times 3 \times 3$

$\square = 45$

Hence, the required fraction is $\frac{27}{45}$.

5. Find the equivalent fraction of $\frac{36}{48}$ with

(a) numerator 9 (b) denominator 4

Sol. (a) $\frac{36}{48}=\frac{9}{\square}$

$36 \times \square = 48 \times 9$

$3 \times 3 \times 2 \times 2 \square = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

$\square = 12$

Hence, the required fraction is $\frac{9}{12}$.

(b) $\frac{36}{48}=\frac{\square}{4}$

$36 \times 4 = 48 \times \square$

$3 \times 3 \times 2 \times 2 \times 2 \times 2$

$= 2 \times 2 \times 2 \times 2 \times 3 \times \square$

$3 = \square$

Hence, the required fraction is $\frac{3}{4}$.

6. Check whether the given fractions are equivalent :

(a) $\frac{5}{9}, \frac{30}{54}$ (b) $\frac{3}{10}, \frac{12}{50}$

(c) $\frac{7}{13}, \frac{5}{11}$

Sol. (a) $\frac{5}{9}, \frac{30}{54}$

$\frac{30}{54}=\frac{5\times6}{9\times6}=\frac{5}{9}$

Clearly, both the fractions are equivalent.

(b) $\frac{3}{10}, \frac{12}{50}$

$\frac{3}{10}=\frac{3\times2}{10\times2}=\frac{6}{20}$

$\frac{12}{50}=\frac{6\times2}{25\times2}=\frac{6}{25}$

Clearly, both the fractions are not equivalent.

(c) $\frac{7}{13}, \frac{5}{11}$

$\frac{7}{13}=\frac{7\times11}{13\times11}=\frac{77}{143}$

$\frac{5}{11}=\frac{5\times13}{11\times13}=\frac{65}{143}$

Clearly, both the fractions are not equivalent

7. Reduce the following fractions to simplest form :

(a) $\frac{48}{60}$ (b) $\frac{150}{60}$

(c) $\frac{84}{98}$ (d) $\frac{12}{52}$

(e) $\frac{7}{28}$

Sol. (a) $\frac{48}{60}=\frac{12\times4}{12\times5}=\frac{4}{5}$ (b) $\frac{48}{60}=\frac{12\times4}{12\times5}=\frac{4}{5}$ (c) $\frac{84}{98}=\frac{14\times6}{14\times7}=\frac{6}{7}$

(d) $\frac{12}{52}=\frac{3\times4}{13\times4}=\frac{3}{13}$ (e) $\frac{7}{28}=\frac{7\times1}{7\times4}=\frac{1}{4}$

8. Ramesh had 20 pencils, Sheelu had 50 pencils and Jamaal had 80 pencils. After 4 months, Ramesh used up 10 pencils, Sheelu used up 25 pencils and Jamaal used up 40 pencils. What fraction did each use up? Check if each has used up an equal fraction of her/his pencils?

Sol. Fraction used by Ramesh = $\frac{10}{20}=\frac{1}{2}$

Fraction used by Sheelu = $\frac{25}{50}=\frac{1}{2}$

Fraction used by Jamaal = $\frac{40}{80}=\frac{1}{2}$

Yes, all of them used equal fraction of pencils i.e., $\frac{1}{2}$.

9. Match the equivalent fractions and write two more for each.

(i) $\frac{250}{400}$ (a) $\frac{2}{3}$

(ii) $\frac{180}{200}$ (b) $\frac{2}{5}$

(iii) $\frac{660}{990}$ (c) $\frac{1}{2}$

(iv) $\frac{180}{360}$ (d) $\frac{5}{8}$

(v) $\frac{220}{550}$ (e) $\frac{9}{10}$

Sol. (i) $\frac{250}{400}=\frac{5\times50}{8\times50}=\frac{5}{8}$

Two more fractions are $\frac{25}{40}, \frac{30}{48}$

(ii) $\frac{180}{200}=\frac{9\times20}{10\times20}=\frac{9}{10}$

Two more fractions are $\frac{18}{20}, \frac{27}{30}$

(iii) $\frac{660}{990}=\frac{2\times330}{3\times330}=\frac{2}{3}$

Two more fractions are $\frac{20}{30}, \frac{200}{300}$

(iv) $\frac{180}{360}\times\frac{1\times180}{2\times180}=\frac{1}{2}$

Two more fractions are $\frac{20}{40}, \frac{30}{60}$

(v) $\frac{220}{550}=\frac{2\times110}{5\times110}=\frac{2}{5}$

Two more fractions are $\frac{20}{50}, \frac{40}{100}$

Now, these can be matched as

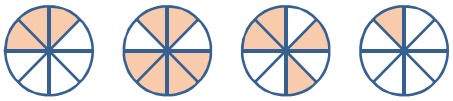
(i) → (d), (ii) → (e),

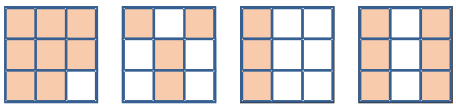
(iii) → (a) (iv) → (c)

(v) → (b)

EXERCISE : 7.4

1. Write shaded portion as fraction. Arrange them in ascending and descending order using correct sign '<', '=', '>' between the fractions:

(a) 

(b) 

(c) Show $\frac{2}{6}, \frac{4}{6}, \frac{8}{6}$ and $\frac{6}{6}$ on the number line.

Put appropriate signs between the fractions given.

$\frac{5}{6}\square\frac{2}{6}$, $\frac{3}{6}\square0$, $\frac{1}{6}\square\frac{6}{6}$, $\frac{8}{6}\square\frac{5}{6}$

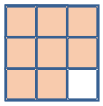
Sol. (a) 

Here, 1st circle represents 3 shaded parts out of 8 equal parts. Therefore, it represents a fraction $\frac{3}{8}$.

Here, 2nd circle represents 6 shaded parts out of 8 equal parts. Therefore, it represents a fraction $\frac{6}{8}$.

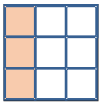
Here, 3rd circle represents 4 shaded parts out of 8 equal parts. Therefore, it represents a fraction $\frac{4}{8}$.

Here, 4th circle represents 1 shaded part out of 8 equal parts. Therefore, it represents a fraction $\frac{1}{8}$. Now, these fractions may be arranged as $\frac{1}{8}<\frac{3}{8}<\frac{4}{8}<\frac{6}{8}$

(b) 

Here, 1st square represents 8 shaded parts out of 9 equal parts. Therefore, it represents a fraction $\frac{8}{9}$.

Here, 2nd square represents 4 shaded parts out of 9 equal parts. Therefore, it represents a fraction $\frac{4}{9}$.

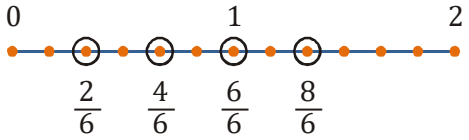


Here, 3rd square represents 3 shaded parts out of 9 equal parts. Therefore, it represents a fraction $\frac{3}{9}=\frac{1}{3}$.

Here, 4th square represents 6 shaded parts out of 9 equal parts. Therefore, it represents a fraction $\frac{6}{9}$.

Now, these fractions can be arranged as $\frac{3}{9}<\frac{4}{9}<\frac{6}{9}<\frac{8}{9}$

(c) To represent the given fractions $\frac{2}{6},\frac{4}{6},\frac{8}{6}$ and $\frac{6}{6}$ on number line, each unit length should be divided in 6 equal parts. Now, these fractions can be represented as



$\frac{5}{6}>\frac{2}{6}$

$\frac{3}{6}>0$

$\frac{1}{6}<\frac{6}{6}$

$\frac{8}{6}>\frac{5}{6}$

2. Compare the fractions and put an appropriate sign.

(a) $\frac{3}{6}\square\frac{5}{6}$ (b) $\frac{1}{7}\square\frac{1}{4}$

(c) $\frac{4}{5}\square\frac{5}{5}$ (d) $\frac{3}{5}\square\frac{3}{7}$

Sol. (a) $\frac{3}{6}<\frac{5}{6}$

Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

(b) $\frac{1}{7}<\frac{1}{4}$

Here, numerators are same. Therefore, the fraction having the lesser denominator will be greater.

(c) $\frac{4}{5}<\frac{5}{5}$

Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

(d) $\frac{3}{5}>\frac{3}{7}$

Here, the numerators are same. Therefore, the fraction having lesser denominator will be greater.

3. Make five more such pairs and put appropriate sign.

Sol. (i) $\frac{6}{7}<\frac{8}{7}$

Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

(ii) $\frac{5}{8}>\frac{3}{8}$

Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

(iii) $\frac{6}{13}>\frac{6}{17}$

Here, numerators are same. Therefore, the fraction having the lesser denominator will be greater.

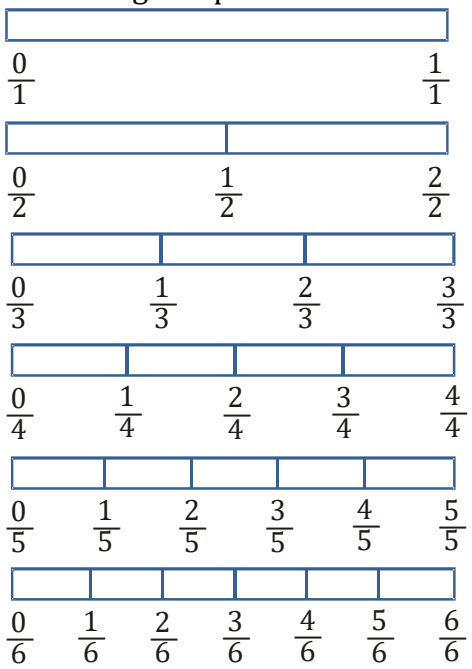
(iv) $\frac{5}{22}>\frac{3}{22}$

Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

(v) $\frac{9}{47}<\frac{9}{42}$

Here, the numerators are same. Therefore, the fraction having the lesser denominator will be greater.

4. Look at the figures and write '<' or '>', '=' between the given pairs of fractions.



(a) $\frac{1}{6}\square\frac{1}{3}$ (b) $\frac{3}{4}\square\frac{2}{6}$

(c) $\frac{2}{3}\square\frac{2}{4}$ (d) $\frac{6}{6}\square\frac{3}{3}$

(e) $\frac{5}{6}\square\frac{5}{5}$

Sol. (a) Here, the numerators are same. Therefore, the fraction having the lesser denominator will be greater.

Hence $\frac{1}{6}\boxed{<}\frac{1}{3}$

(b) $\frac{3}{4}=\frac{3\times3}{4\times3}=\frac{9}{12}$

$\frac{2}{6}=\frac{2\times2}{6\times2}=\frac{4}{12}$

As the denominators of $\frac{9}{12},\frac{4}{12}$ are same, the fraction having the greater numerator will be greater.

Hence, $\frac{3}{4}\boxed{>}\frac{2}{6}$.

(c) Here, the numerators are same. Therefore, the fraction having the lesser denominator will be greater.

Hence, $\frac{2}{3}\boxed{>}\frac{2}{4}$.

(d) As $\frac{6}{6}=1,\frac{3}{3}=1$

$\frac{6}{6}\boxed{=}\frac{3}{3}$

(e) Here, the numerators are same. Therefore, the fraction having the lesser denominator will be greater.

Hence, $\frac{5}{6}\boxed{<}\frac{5}{5}$.

5. How quickly can you do this? Fill appropriate sign ('<', '=', '>')

(a) $\frac{1}{2}\square\frac{1}{5}$ (b) $\frac{2}{4}\square\frac{3}{6}$

(c) $\frac{3}{5}\square\frac{2}{3}$ (d) $\frac{3}{4}\square\frac{2}{8}$

(e) $\frac{3}{5}\square\frac{6}{5}$ (f) $\frac{7}{9}\square\frac{3}{9}$

(g) $\frac{1}{4}\square\frac{2}{8}$ (h) $\frac{6}{10}\square\frac{4}{5}$

(i) $\frac{3}{4}\square\frac{7}{8}$ (j) $\frac{6}{10}\square\frac{3}{5}$

(k) $\frac{5}{7}\square\frac{15}{21}$

Sol. (a) Here, the numerators are same. Therefore, the fraction having the lesser denominator will be greater.

Hence, $\frac{1}{2}>\frac{1}{5}$

(b) $\frac{2}{4}=\frac{1}{2}$ and $\frac{3}{6}=\frac{1}{2}$

Hence, $\frac{2}{4}=\frac{3}{6}$

(c) $\frac{3}{5}=\frac{3\times3}{5\times3}=\frac{9}{15}$

$\frac{2}{3}=\frac{2\times5}{3\times5}=\frac{10}{15}$

As the denominators of $\frac{9}{15}$ and $\frac{10}{15}$ are same, the fraction having the greater numerator will be greater.

Hence, $\frac{3}{5}<\frac{2}{3}$

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

As the denominators of $\frac{3}{4}$ and $\frac{1}{4}$ are same, the fraction having the greater numerator will be greater.

Hence, $\frac{3}{4}>\frac{2}{8}$

(e) Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

Hence, $\frac{3}{5}<\frac{6}{5}$

(f) Here, the denominators are same. Therefore, the fraction having the greater numerator will be greater.

Hence, $\frac{7}{9}>\frac{3}{9}$

(g) $\frac{2}{8}=\frac{1}{4}$

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

(h) $\frac{6}{10}=\frac{3\times2}{5\times2}=\frac{3}{5}$

As the denominators of $\frac{3}{5}$ and $\frac{4}{5}$ are same, the fraction having the greater numerator will be greater.

Hence, $\frac{6}{10}<\frac{4}{5}$

(i) $\frac{3}{4}=\frac{3\times2}{4\times2}=\frac{6}{8}$

As the denominators of $\frac{6}{8}$ and $\frac{7}{8}$ are same, the fraction having the greater numerator will be greater.

Hence, $\frac{3}{4}<\frac{7}{8}$

(j) $\frac{6}{10}=\frac{3\times2}{5\times2}=\frac{3}{5}$

Hence, $\frac{6}{10}=\frac{3}{5}$

(k) $\frac{5}{7}=\frac{5\times3}{7\times3}=\frac{15}{21}$

Hence, $\frac{5}{7}=\frac{15}{21}$

6. The following fractions represent just three different numbers. Separate them into three groups of equivalent fractions, by changing each one to its simplest form.

(a) $\frac{2}{12}$ (b) $\frac{3}{15}$

(c) $\frac{8}{50}$ (d) $\frac{16}{100}$

(e) $\frac{10}{60}$ (f) $\frac{15}{75}$

(g) $\frac{12}{60}$ (h) $\frac{16}{96}$

(i) $\frac{12}{75}$ (j) $\frac{12}{72}$

(k) $\frac{3}{18}$ (l) $\frac{4}{25}$

Sol. (a) $\frac{2}{12}=\frac{1\times2}{6\times2}=\frac{1}{6}$ (b) $\frac{3}{15}=\frac{1\times3}{5\times3}=\frac{1}{5}$

(c) $\frac{8}{50}=\frac{4\times2}{25\times2}=\frac{4}{25}$

(d) $\frac{16}{100}=\frac{4\times4}{25\times4}=\frac{4}{25}$

(e) $\frac{10}{60}=\frac{1\times10}{6\times10}=\frac{1}{6}$ (f) $\frac{15}{75}=\frac{1\times15}{5\times15}=\frac{1}{5}$

(g) $\frac{12}{60}=\frac{1\times12}{5\times12}=\frac{1}{5}$ (h) $\frac{16}{96}=\frac{1\times16}{6\times16}=\frac{1}{6}$

(i) $\frac{12}{75}=\frac{4\times3}{25\times3}=\frac{4}{25}$ (j) $\frac{12}{72}=\frac{1\times12}{6\times12}=\frac{1}{6}$

(k) $\frac{3}{18}=\frac{1\times3}{6\times3}=\frac{1}{6}$ (l) $\frac{4}{25}$

There are 3 groups of equivalent fractions.

$\frac{1}{6}\rightarrow$ (a), (e), (h), (j), (k)

$\frac{1}{5}\rightarrow$ (b), (f), (g)

$\frac{4}{25}\rightarrow$ (c), (d), (i), (l)

7. Find answers to the following. Write and indicate how you solved them.

(a) Is $\frac{5}{9}$ equal to $\frac{4}{5}$?

(b) Is $\frac{9}{16}$ equal to $\frac{5}{9}$?

(c) Is $\frac{4}{5}$ equal to $\frac{16}{20}$?

(d) Is $\frac{1}{15}$ equal to $\frac{4}{30}$?

Sol. (a) $\frac{5}{9},\frac{4}{5}$

Converting these into like fractions,

$\frac{5}{9}=\frac{5}{9}\times\frac{5}{5}=\frac{25}{45}$

$\frac{4}{5}=\frac{4}{5}\times\frac{9}{9}=\frac{36}{45}$

As, $\frac{36}{45}\neq\frac{25}{45}$

Therefore $\frac{5}{9}$, is not equal to $\frac{4}{5}$.

(b) $\frac{9}{16},\frac{5}{9}$

Converting these into like fractions,

$\frac{9}{16}=\frac{9}{16}\times\frac{9}{9}=\frac{81}{144}$

$\frac{5}{9}=\frac{5}{9}\times\frac{16}{16}=\frac{80}{144}$

As, $\frac{81}{144}\neq\frac{80}{144}$

Therefore, $\frac{9}{16}$ is not equal to $\frac{5}{9}$.

(c) $\frac{4}{5},\frac{16}{20}$

$\frac{16}{20}=\frac{4\times4}{5\times4}=\frac{4}{5}$

Therefore, $\frac{4}{5}$ is equal to $\frac{16}{20}$

(d) $\frac{1}{15}, \frac{4}{30}$

$\frac{4}{30}=\frac{2\times2}{15\times2}=\frac{2}{15}$

Therefore, $\frac{1}{15}$ is not equal to $\frac{4}{30}$.

8. Ila read 25 pages of a book containing 100 pages. Lalita read $\frac{2}{5}$ of the same book. Who read less?

Sol. Numbers of pages read by Lalita= $\frac{2}{5}\times100$

= 40

Number of pages read by ila = 25

Hence, Ila has read less number of pages.

9. Rafiq exercised for $\frac{3}{6}$ of an hour, while Rohit exercised for $\frac{3}{4}$ of an hour. Who exercised for a longer time?

Sol. Rafiq exercised for $\frac{3}{6}$hr and Rohit exercised for $\frac{3}{4}$hr. Converting these into like fractions,

$\frac{3}{6}=\frac{3\times2}{6\times2}=\frac{6}{12}$

$\frac{3}{4}=\frac{3\times3}{4\times3}=\frac{9}{12}$

$\frac{9}{12}>\frac{6}{12}\Rightarrow\frac{3}{4}>\frac{3}{6}$

Hence, Rohit exercised for a longer time.

10. In a class A of 25 students, 20 passed with 60% or more marks; in another class B of 30 students, 24 passed with 60% or more marks. In which class was a greater fraction of students getting with 60% or more marks?

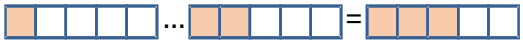
Sol. Fraction of students of class A who passed in Ist class = $\frac{20}{25}=\frac{4}{5}$

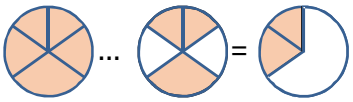
Fraction of students of class B who passed in Ist class = $\frac{24}{30}=\frac{4}{5}$

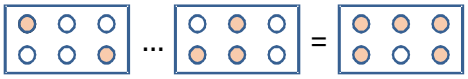
From both classes, an equal fraction i.e., $\frac{4}{5}$ of students passed in first class.

EXERCISE : 7.5

1. Write these fractions appropriately as additions or subtractions

(a) 

(b) 

(c) 

Sol. (a) Here, it can be observed that 1st, 2nd, and 3rd rectangles are representing 1, 2, and 3 shaded parts out of 5 equal parts respectively. Clearly, the fraction represented by 3rd rectangle is the sum of the fractions represented by 1st and 2nd rectangles.

Hence, $\frac{1}{5}+\frac{2}{5}=\frac{3}{5}$

(b) Here, it can be observed that 1st, 2nd, and 3rd circles are representing 5, 3, and 2 shaded parts out of 5 equal parts respectively. Clearly, the fraction represented by 3rd circle is the difference between the fractions represented by 1st and 2nd circles.

Hence, $\frac{5}{5}-\frac{3}{5}=\frac{2}{5}$

(c) Here, it can be observed that 1st, 2nd, and 3rd rectangles are representing 2, 3, and 5 shaded parts out of 6 equal parts respectively. Clearly, the fraction represented by 3rd rectangle is the sum of the fractions represented by 1st and 2nd rectangles.

Hence, $\frac{2}{6}+\frac{3}{6}=\frac{5}{6}$

2. Solve

(a) $\frac{1}{18}+\frac{1}{18}$ (b) $\frac{8}{15}+\frac{3}{15}$

(c) $\frac{7}{7}-\frac{5}{7}$ (d) $\frac{1}{22}+\frac{21}{22}$

(e) $\frac{12}{15}-\frac{7}{15}$ (f) $\frac{5}{8}+\frac{3}{8}$

(g) $1-\frac{2}{3}\left(1=\frac{3}{3}\right)$ (h) $\frac{1}{4}+\frac{0}{4}$

(i) $3-\frac{12}{5}$

Sol. (a) $\frac{1}{18}+\frac{1}{18}=\frac{1+1}{18}=\frac{2}{18}=\frac{1}{9}$

(b) $\frac{8}{15}+\frac{3}{15}=\frac{8+3}{15}=\frac{11}{15}$

(c) $\frac{7}{7}-\frac{5}{7}=\frac{7-5}{7}=\frac{2}{7}$

(d) $\frac{1}{22}+\frac{21}{22}=\frac{1+21}{22}=\frac{22}{22}=1$

(e) $\frac{12}{15}-\frac{7}{15}=\frac{12-7}{15}=\frac{5}{15}=\frac{1}{3}$

(f) $\frac{5}{8}+\frac{3}{8}=\frac{5+3}{8}=\frac{8}{8}=1$

(g) $1-\frac{2}{3}=\frac{3}{3}-\frac{3}{3}=\frac{3-2}{3}=\frac{1}{3}$

(h) $\frac{1}{4}+\frac{0}{4}=\frac{1}{4}+0=\frac{1}{4}$

(i) $3-\frac{12}{5}=\frac{15}{5}-\frac{12}{5}=\frac{15-12}{5}=\frac{3}{5}$

3. Shubham painted $\frac{2}{3}$ of the wall space in his room. His sister Madhavi helped and painted $\frac{1}{3}$ of the wall space. How much did they paint together?

Sol. Space painted by Shubham = $\frac{2}{3}$ of the room

Space painted by Madhavi = $\frac{1}{3}$ of the room

Hence, together they painted = $\left(\frac{2}{3}+\frac{1}{3}\right)$ of the room = 1 = the complete wall

4. Fill in the missing fractions.

(a) $\frac{7}{10}-\square=\frac{3}{10}$ (b) $\square-\frac{3}{21}=\frac{5}{21}$

(c) $\square-\frac{3}{6}=\frac{3}{6}$ (d) $\square+\frac{5}{27}=\frac{12}{27}$

Sol. (a) $\frac{7}{10}-\square=\frac{3}{10}$

$\square=\frac{7}{10}-\frac{3}{10}=\frac{7-3}{10}=\frac{4}{10}=\frac{2}{5}$

(b) $\square-\frac{3}{21}=\frac{5}{21}$

$\square=\frac{5}{21}+\frac{3}{21}=\frac{5+3}{21}=\frac{8}{21}$

(c) $\square-\frac{3}{6}=\frac{3}{6}=\square=\frac{3}{6}+\frac{3}{6}=\frac{3+3}{6}=\frac{6}{6}=1$

(d) $\square+\frac{5}{27}=\frac{12}{27}$

$\square=\frac{12}{27}-\frac{5}{27}=\frac{7}{27}$

5. Javed was given $\frac{5}{7}$ of a basket of oranges. What fraction of oranges was left in the basket?

Sol. Fractions given to Javed = $\frac{5}{7}$

Fraction left in the basket

$1-\frac{5}{7}=\frac{7}{7}-\frac{5}{7}=\frac{7-5}{7}=\frac{2}{7}$

EXERCISE : 7.6

1. Solve

(a) $\frac{2}{3}+\frac{1}{7}$ (b) $\frac{3}{10}+\frac{7}{15}$

(c) $\frac{4}{9}+\frac{2}{7}$ (d) $\frac{5}{7}+\frac{1}{3}$

(e) $\frac{2}{5}+\frac{1}{6}$ (f) $\frac{4}{5}+\frac{2}{3}$

(g) $\frac{3}{4}-\frac{1}{3}$ (h) $\frac{5}{6}-\frac{1}{3}$

(i) $\frac{2}{3}+\frac{3}{4}+\frac{1}{2}$ (j) $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}$

(k) $1\frac{1}{3}+3\frac{2}{3}$ (l) $4\frac{2}{3}+3\frac{1}{4}$

(m) $\frac{16}{5}-\frac{7}{5}$ (n) $\frac{4}{3}-\frac{1}{2}$

Sol. (a) $\frac{2}{3}+\frac{1}{7}$

$\frac{(2\times7)+(1\times3)}{21}$ (Taking L.C. M as 21)

$= \frac{14+3}{21}=\frac{17}{21}$

(b) $\frac{3}{10}+\frac{7}{15}$

$= \frac{(3\times3)+(7\times2)}{30}$ (Taking 30 as L.C.M.)

$= \frac{9+14}{30}=\frac{23}{30}$

(c) $\frac{4}{9}+\frac{2}{7}$

$= \frac{28+18}{63}$ (Taking L.C.M as 63) $= \frac{46}{63}$

(d) $\frac{5}{7}+\frac{1}{3}$

$\frac{15+7}{21}$ (Taking L.C.M as 21)

$\frac{22}{21}=1\frac{1}{21}$

(e) $\frac{2}{5}+\frac{1}{6}$

$= \frac{12+5}{30}$ (Taking L.C.M as 30) $= \frac{17}{30}$

(f) $\frac{4}{5}+\frac{2}{3}$

$= \frac{12+10}{15}$ (Taking L.C.M as 15)

$= \frac{22}{15}=1\frac{7}{15}$

(g) $\frac{3}{4}-\frac{1}{3}$

$= \frac{9-4}{12}$ (Taking L.C.M as 12) $= \frac{5}{12}$

(h) $\frac{5}{6}-\frac{1}{3}$

$= \frac{5-2}{6}$ (Taking L.C.M as 6) $= \frac{3}{6}=\frac{1}{2}$

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

$= \frac{8+9+6}{12}$ (Taking L.C.M as 12)

$= \frac{23}{12}=1\frac{11}{12}$

(j) $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}$

$= \frac{3+2+1}{6}$ (Taking L.C.M as 6) $= \frac{6}{6} = 1$

(k) $1\frac{1}{3}+3\frac{2}{3}$

$= \frac{4}{3}+\frac{11}{3}$

$= \frac{4+11}{3}$ (Taking L.C.M as 3) $= \frac{15}{3} = 5$

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

$= \frac{14}{3}+\frac{13}{4}$

$= \frac{56+39}{12}$ (Taking L.C.M as 12)

$= \frac{95}{12}=7\frac{11}{12}$

(m) $\frac{16}{5}-\frac{7}{5}$

$= \frac{16-7}{5}$ (Taking L.C.M as 9) $= \frac{9}{5}=1\frac{4}{5}$

(n) $\frac{4}{3}-\frac{1}{2}$

$= \frac{8-3}{6}$ (Taking L.C.M as 6) $= \frac{5}{6}$

2. Sarita bought $\frac{2}{5}$ metre of ribbon and Lalita $\frac{3}{4}$ metre of ribbon. What is the total length of the ribbon they bought?

Sol. Length of ribbon bought by Sarita $= \frac{2}{5}$ m

Length of ribbon bought by Lalita $= \frac{3}{4}$ m

Total length of ribbon bought by them

$= \frac{2}{5}+\frac{3}{4}$

$= \frac{(2\times4)+(3\times5)}{20}=\frac{8+15}{20}=\frac{23}{20}$ m

3. Naina was given $1\frac{1}{2}$ piece of cake and Najma was given $1\frac{1}{3}$ piece of cake. Find the total amount of cake was given to both of them.

Sol. Fraction Naina got = $1\frac{1}{2}=\frac{3}{2}$

Fraction Najma got = $1\frac{1}{3}=\frac{4}{3}$

Total amount of cake given to them

$=\frac{3}{2}+\frac{4}{3}=\frac{3\times3+4\times2}{6}=\frac{9+8}{6}=\frac{17}{6}=2\frac{5}{6}$

4. Fill in the boxes :

(a) $\square-\frac{5}{8}=\frac{1}{4}$ (b) $\square-\frac{1}{5}=\frac{1}{2}$

(c) $\frac{1}{2}-\square=\frac{1}{6}$

Sol. (a) $\square-\frac{5}{8}=\frac{1}{4}$

$\square=\frac{1}{4}+\frac{5}{8}=\frac{1\times2+5}{8}=\frac{2+5}{8}=\frac{7}{8}$

(b) $\square-\frac{1}{5}=\frac{1}{2}$

$\square=\frac{1}{2}+\frac{1}{5}$

$=\frac{(1\times5)+(1\times2)}{10}=\frac{5+2}{10}=\frac{7}{10}$

(c) $\frac{1}{2}-\square=\frac{1}{6}$

$=\square=\frac{1}{2}-\frac{1}{6}=\frac{(1\times3)-1}{6}=\frac{3-1}{6}=\frac{2}{6}=\frac{1}{3}$

5. Complete the addition-subtraction box.

(a)

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

(b)

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

Sol. (a) $\frac{2}{3}+\frac{4}{3}=\frac{2+4}{3}=\frac{6}{3}=2$

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

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

$\frac{4}{3}-\frac{2}{3}=\frac{4-2}{3}=\frac{2}{3}$

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

Hence, the given box can be completed as

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

(b) $\frac{1}{2}+\frac{1}{3}=\frac{(1\times3)+(1\times2)}{6}=\frac{3+2}{6}=\frac{5}{6}$

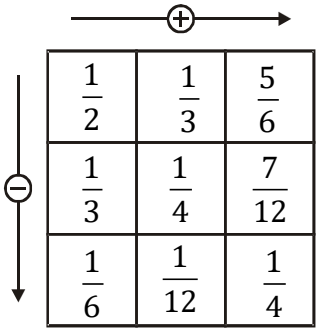
$\frac{1}{3}+\frac{1}{4}=\frac{(1\times4)+(1\times3)}{12}=\frac{4+3}{12}=\frac{7}{12}$

$\frac{1}{2}-\frac{1}{3}=\frac{(1\times3)-(1\times2)}{12}=\frac{3-2}{6}=\frac{1}{6}$

$\frac{1}{3}-\frac{1}{4}=\frac{(1\times4)-(1\times3)}{12}=\frac{4-3}{12}=\frac{1}{12}$

$\frac{1}{6}+\frac{1}{12}=\frac{(1\times2)+1}{12}=\frac{2+1}{12}=\frac{3}{11}=\frac{1}{4}$

Hence, the given box can be completed as



$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{6}$
$\frac{1}{3}$	$\frac{1}{4}$	$\frac{7}{12}$
$\frac{1}{6}$	$\frac{1}{12}$	$\frac{1}{4}$

6. A piece of wire $\frac{7}{8}$ metre long broke into two pieces. One piece was $\frac{1}{4}$ metre long. How long is the other piece?

Sol. Length of one piece = $\frac{1}{4}$ m

The length of the other piece of wire will be the difference of the lengths of the original wire and this piece of wire.

Hence, length of the other piece of wire = $\frac{7}{8}-\frac{1}{4}$.

$\frac{7-(1\times 2)}{8}=\frac{7-2}{8}=\frac{5}{8}$ m

7. Nandini's house is $\frac{9}{10}$ km from her school. She walked some distance and then took a bus for $\frac{1}{2}$ km to reach the school. How far did she walk?

Sol. Distance walked by Nandini = Total distance– Distance for which she took the bus $\frac{9}{10}-\frac{1}{2}$

$\frac{9-1\times 5}{10}=\frac{9-5}{10}=\frac{4}{10}=\frac{2}{5}$ km

8. Asha and Samuel have bookshelves of the same size partly filled with books. Asha's shelf is $\frac{5}{6}$ th full and Samuel's shelf is $\frac{2}{5}$ th full. Whose bookshelf is more full? By what fraction?

Sol. Fraction of Asha's shelf = $\frac{5}{6}$

Fraction of Samuel's shelf = $\frac{2}{5}$

Converting these into like fractions,

$\frac{5}{6}=\frac{5}{6}\times\frac{5}{5}=\frac{25}{30}$

$\frac{2}{5}=\frac{2}{5}\times\frac{6}{6}=\frac{12}{30}$

$\frac{25}{30}>\frac{12}{30}$

Clearly, Asha's bookshelf is more full.

Difference = $\frac{5}{6}-\frac{2}{5}=\frac{25}{30}-\frac{12}{30}=\frac{13}{30}$

9. Jaidev takes $2\frac{1}{5}$ minutes to walk across the school ground. Rahul takes $\frac{7}{4}$ minutes to do the same. Who takes less time and by what fraction?

Sol. Time taken by Jaidev = $2\frac{1}{5}$ minutes = $\frac{11}{5}$ min

Time taken by Rahul = $\frac{7}{4}$ min

Converting these into like fractions,

$\frac{11}{5}=\frac{11}{5}\times\frac{4}{4}=\frac{44}{20}$

$\frac{7}{4}=\frac{7}{4}\times\frac{5}{5}=\frac{35}{20}$

As 44 > 35, $\frac{11}{5}>\frac{7}{4}$

Hence, Rahul takes lesser time.

Difference = $\frac{11}{5}-\frac{7}{4}$

= $\frac{44}{20}-\frac{35}{20}=\frac{9}{20}$