Exercise

In questions 1 to 20, out of four options, only one is correct. Write the correct answer.

1. $\frac{2}{5} \times 5\frac{1}{5}$ **is equal to:**

(a) $\frac{26}{25}$ **(b)** $\frac{52}{25}$ **(c)** $\frac{2}{5}$ **(d) 6**

Solution:-

$$\frac{2}{5} \times 5\frac{1}{5} = \frac{2}{5} \times \left(\frac{5 \times 5 + 1}{5}\right)$$
$$= \frac{2}{5} \times \frac{26}{5}$$
$$= \frac{52}{25}$$

Hence, the correct option is (b).

2. $3\frac{3}{4} + \frac{3}{4}$ **is equal to:**

(a) 3   **(b) 4**   **(c) 5**   **(d)** $\frac{46}{16}$

Solution:-

$$3\frac{3}{4} \div \frac{3}{4} = \left(\frac{3 \times 4 + 3}{4}\right) \div \frac{3}{4}$$
$$= \frac{12 + 3}{4} \div \frac{3}{4}$$
$$= \frac{15}{4} \div \frac{3}{4}$$
$$= \frac{15}{4} \times \frac{4}{3}$$
$$= 5$$

Hence, the correct option is (c).

3. A ribbon of length $5\frac{1}{4}$ **m is cut into small pieces each of length** $\frac{3}{4}$ **m.**

Number of pieces will be:

(a) 5   **(b) 6**   **(c) 7**   **(d) 8**

Solution:-

Number of pieces = $\dfrac{\text{Total length of ribbon}}{\text{Length of one piece}}$

$= \dfrac{5\dfrac{1}{4}}{\dfrac{3}{4}}$

$= \dfrac{\dfrac{5\times 4+1}{4}}{\dfrac{3}{4}}$

$= \dfrac{\dfrac{21}{4}}{\dfrac{3}{4}}$

$= \dfrac{21}{4}\times\dfrac{4}{3}$

$= 7$

Hence, the correct option is (c).

4. The ascending arrangement of $\dfrac{2}{3}, \dfrac{6}{7}, \dfrac{13}{21}$ is:

(a) $\dfrac{6}{7}, \dfrac{2}{3}, \dfrac{13}{21}$ **(b)** $\dfrac{13}{21}, \dfrac{2}{3}, \dfrac{6}{7}$ **(c)** $\dfrac{6}{7}, \dfrac{13}{21}, \dfrac{2}{3}$ **(d)** $\dfrac{2}{3}, \dfrac{6}{7}, \dfrac{13}{21}$

Solution:-

Given: $\dfrac{2}{3}, \dfrac{6}{7}, \dfrac{13}{21}$

21 is the LCM of denominators (3, 7, 21).

So, $\dfrac{2}{3} = \dfrac{2\times 7}{3\times 7} = \dfrac{14}{21}; \dfrac{6}{7} = \dfrac{6\times 3}{7\times 3} = \dfrac{18}{21}; \dfrac{13}{21} = \dfrac{13\times 1}{21\times 1} = \dfrac{13}{21}$

Since, 13<14<18

Therefore, the ascending arrangement is $\dfrac{13}{21}, \dfrac{2}{3}, \dfrac{6}{7}$

Hence, the correct option is (B).

5. Reciprocal of the fraction $\dfrac{2}{3}$ is:

(a) 2   **(b) 3**   **(c)** $\dfrac{2}{3}$ **(d)** $\dfrac{3}{2}$

Solution:-

Reciprocal of the fraction $\dfrac{2}{3}$ is $\dfrac{3}{2}$.

6. The product of $\frac{11}{13}$ and 4 is:

(a) $3\frac{5}{13}$ **(b)** $3\frac{3}{13}$ **(c)** $13\frac{3}{5}$ **(d)** $13\frac{5}{3}$

Solution:-

The product of $\frac{11}{13}$ and $4 = \frac{11}{13} \times 4$

$= \frac{11}{13} \times 4$

$= \frac{44}{13}$

$= 3\frac{5}{13}$

Hence, the product of $\frac{11}{13}$ and 4 is $3\frac{5}{13}$.

7. The product of 3 and $4\frac{2}{5}$ is:

(a) $17\frac{2}{5}$ **(b)** $\frac{24}{5}$ **(c)** $13\frac{1}{5}$ **(d)** $5\frac{1}{13}$

Solution:-

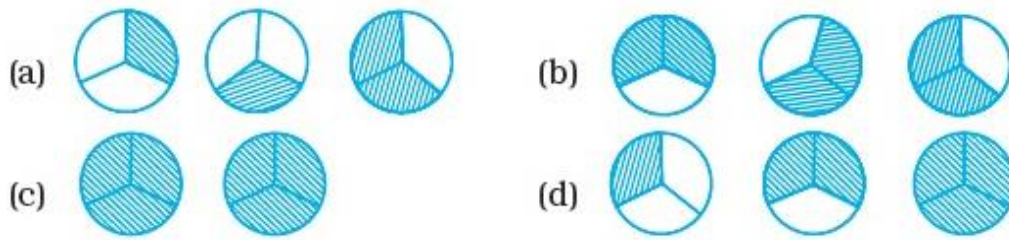The product of 3 and $4\frac{2}{5} = 3 \times 4\frac{2}{5}$

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

$= 3 \times \frac{22}{5}$

$= \frac{66}{5}$

$= 13\frac{1}{5}$

Hence, the product of 3 and $4\frac{2}{5}$ is $13\frac{1}{5}$.

8. Pictorial representation of $3 \times \frac{2}{3}$ is:

(a)   (b)

(c)   (d)

Solution:-

Pictorial representation of $3 \times \dfrac{2}{3} = \dfrac{2}{3} + \dfrac{2}{3} + \dfrac{2}{3}$

Hence, the correct option is (b).

9. $\dfrac{1}{5} \div \dfrac{4}{5}$ **equal to:**

(a) $\dfrac{4}{5}$ **(b)** $\dfrac{1}{5}$ **(c)** $\dfrac{5}{4}$ **(d)** $\dfrac{1}{4}$

Solution:-

Given: $\dfrac{1}{5} \div \dfrac{4}{5}$

So, $\dfrac{1}{5} \div \dfrac{4}{5} = \dfrac{1}{5} \times \dfrac{5}{4}$

$= \dfrac{1}{4}$

Hence, the correct option is (d).

10. The product of 0.03×0.9 is:
(a) 2.7   **(b) 0.27**   **(c) 0.027**   **(d) 0.0027**

Solution:-

Given: 0.03×0.9

So, $0.03 \times 0.9 = \dfrac{3}{100} \times \dfrac{9}{10} = \dfrac{27}{1000} = 0.027$

So, the product of 0.03×0.9 is 0.027.

Hence, the correct option is (C).

11. $\dfrac{5}{7} \div 6$ **is equal to:**

(a) $\dfrac{30}{7}$ **(b)** $\dfrac{5}{42}$ **(c)** $\dfrac{30}{42}$ **(d)** $\dfrac{6}{7}$

Solution:-

$\dfrac{5}{7} \div 6 = \dfrac{5}{7} \times \dfrac{1}{6}$

$$= \frac{5}{42}$$

So, $\frac{5}{7} \div 6$ is equal to $\frac{5}{42}$.

Hence, the correct option is (b).

12. $5\frac{1}{6} \div \frac{9}{2}$ is equal to

(a) $\frac{31}{6}$ (b) $\frac{1}{27}$ (c) $5\frac{1}{27}$ (d) $\frac{31}{27}$

Solution:-

$$5\frac{1}{6} \div \frac{9}{2} = \left(\frac{5 \times 6 + 1}{6} \right) \div \frac{2}{9}$$

$$= \frac{31}{6} \times \frac{2}{9}$$

$$= \frac{31}{27}$$

So, $5\frac{1}{6} \div \frac{9}{2}$ is equal to $\frac{31}{27}$.

Hence, the correct option is (d).

13. Which of the following represents $\frac{1}{3}$ of $\frac{1}{6}$?

(a) $\frac{1}{3} + \frac{1}{6}$ (b) $\frac{1}{3} - \frac{1}{6}$ (c) $\frac{1}{3} \times \frac{1}{6}$ (d) $\frac{1}{3} \div \frac{1}{6}$

Solution:-

$$\frac{1}{3} \text{ of } \frac{1}{6} = \frac{1}{3} \times \frac{1}{6}$$

Hence, the correct option is (C).

14. $\frac{3}{7}$ of $\frac{2}{5}$ is equal to

(a) $\frac{5}{12}$ (b) $\frac{5}{35}$ (c) $\frac{1}{35}$ (d) $\frac{6}{35}$

Solution:-

$$\frac{3}{7} \text{ of } \frac{2}{5} = \frac{3}{7} \times \frac{2}{5}$$

$$= \frac{6}{35}$$

Hence, the correct option is (d).

15. One packet of biscuits requires $2\frac{1}{2}$ cups of flour and $1\frac{2}{3}$ cups of sugar. Estimated total quantity of both ingredients used in 10 such packets of biscuits will be

(a) less than 30 cups
(b) between 30 cups and 40 cups
(c) between 40 cups and 50 cups
(d) above 50 cups

Solution:-

The requirement of flour and sugar for one packet of biscuits $= \left(2\frac{1}{2}+1\frac{2}{3}\right)$ cups

$$= \left(\frac{5}{2}+\frac{5}{3}\right) \text{cups}$$

$$= \left(\frac{15+10}{6}\right) \text{cups}$$

$$= \frac{25}{6} \text{cups}$$

So, the requirement of both ingredients for 10 packets $= 10\times\frac{25}{6} \text{cups}$

$$=5\times\frac{25}{3} \text{cups}$$

$$=\frac{125}{6} \text{cups}$$

$$=41\frac{2}{3} \text{cups}$$

That is between 40 cups and 50 cups.
Hence, the correct option is (C).

16. The product of 7 and $6\frac{3}{4}$ is

(a) $42\frac{1}{4}$ (b) $47\frac{1}{4}$ (c) $42\frac{3}{4}$ (d) $47\frac{3}{4}$

Solution:-

The product of 7 and $6\frac{3}{4} = 7\times 6\frac{3}{4}$

$$= \frac{7}{1} \times \frac{27}{4}$$

$$= \frac{189}{4}$$

$$= 47\frac{1}{4}$$

Hence, the correct option is (b).

17. On dividing 7 by $\frac{2}{5}$, the result is

(a) $\frac{14}{2}$ (b) $\frac{35}{4}$ (c) $\frac{14}{5}$ (d) $\frac{35}{2}$

Solution:-
According to the question:

$$7 \div \frac{2}{3} = 7 \times \frac{3}{2}$$

$$= \frac{35}{2}$$

Hence, the correct option is (d).

18. $2\frac{2}{3} \div 5$ is equal to

(a) $\frac{8}{15}$ (b) $\frac{40}{3}$ (c) $\frac{40}{5}$ (d) $\frac{8}{3}$

Solution:-

$$2\frac{2}{3} \div 5 = \left(\frac{2 \times 3 + 2}{3} \right) \div 5$$

$$= \frac{8}{3} \div 5$$

$$= \frac{8}{3} \times \frac{1}{5}$$

$$= \frac{8}{15}$$

Hence, the correct option is (a).

19. $\frac{4}{5}$ of 5 kg apples were used on Monday. The next day $\frac{1}{3}$ of what was left was used. Weight (in kg) of apples left now is

(a) $\frac{2}{7}$ (b) $\frac{1}{14}$ (c) $\frac{2}{3}$ (d) $\frac{4}{21}$

Solution:-

According to the question:

Weight of apples used on Monday = $\dfrac{4}{5}$ of 5 kg

$$= \dfrac{4}{5} \times 5 \text{kg}$$
$$= 4 \text{kg}$$

So, weight of apples left on next day = (5 – 4) kg = 1 kg

Now, weight of apples used on next day $= \dfrac{1}{3}$ of 1kg

$$= \dfrac{1}{3} \times 1 \text{kg}$$
$$= \dfrac{1}{3} \text{kg}$$

Therefore, weight of apples left now $= \left(1 - \dfrac{1}{3}\right) \text{kg}$

$$= \dfrac{2}{3} \text{kg}$$

Hence, the correct option is (C).

20. The picture

interprets

(a) $\dfrac{1}{4} \div 3$ (b) $3 \times \dfrac{1}{4}$ (c) $\dfrac{3}{4} \times 3$ (d) $3 \div \dfrac{1}{4}$

Solution:-

See the given figure in the question:

$$\dfrac{1}{4} + \dfrac{1}{4} + \dfrac{1}{4} = 3 \times \dfrac{1}{4}$$

Hence, the correct option is (b).

In Questions 21 to 44, fill in the blanks to make the statements true.

21. Rani ate $\dfrac{2}{7}$ part of a cake while her brother Ravi ate $\dfrac{4}{5}$ of the remaining. Part of the cake left is _____

Solution:-

Let whole part of the cake is 1.

Part of the cake Rani ate $= \dfrac{2}{7}$ of 1 that is $\dfrac{2}{7}$.

So, part of the cake left $= 1 - \dfrac{2}{7} = \dfrac{5}{7}$

Now, part of the cake Ravi ate $= \dfrac{4}{5} \times \dfrac{5}{7} = \dfrac{4}{7}$

Therefore, part of the cake left $= \dfrac{5}{7} - \dfrac{4}{7} = \dfrac{1}{7}$.

22. The reciprocal of $\dfrac{3}{7}$ is _____

Solution:-

The reciprocal of $\dfrac{3}{7}$ is $\dfrac{7}{3}$.

23. $\dfrac{2}{3}$ of 27 is _____

Solution:-

$\dfrac{2}{3}$ of $27 = \dfrac{2}{3} \times 27$

$\qquad = 2 \times 9$

$\qquad = 18$

Hence, $\dfrac{2}{3}$ of 27 is 18.

24. $\dfrac{4}{5}$ of 45 is _____

Solution:-

$\dfrac{4}{5}$ of $45 = \dfrac{4}{5} \times 45$

$\qquad = 4 \times 9$

$\qquad = 36$

Hence, $\dfrac{4}{5}$ of 45 is 36.

25. $4 \times 6\dfrac{1}{3}$ is equal to _____

Solution:-

$$4 \times 6\frac{1}{3} = 4 \times \left(\frac{6 \times 3 + 1}{3}\right)$$

$$= 4 \times \frac{19}{3}$$

$$= \frac{76}{3}$$

$$= 25\frac{1}{3}$$

Hence, $4 \times 6\frac{1}{3}$ is equal to $25\frac{1}{3}$.

26. $\frac{1}{2}$ **of** $4\frac{2}{7}$ **is** _____

Solution:-

$$\frac{1}{2} \text{ of } 4\frac{2}{7} = \frac{1}{2} \times \left(\frac{4 \times 7 + 2}{7}\right)$$

$$= \frac{1}{2} \times \frac{30}{7}$$

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

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

Hence, $\frac{1}{2}$ of $4\frac{2}{7}$ is $2\frac{1}{7}$.

27. $\frac{1}{9}$ **of** $\frac{6}{5}$ **is** _____

Solution:-

$$\frac{1}{9} \text{ of } \frac{6}{5} = \frac{1}{9} \times \frac{6}{5}$$

$$= \frac{1}{3} \times \frac{2}{5}$$

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

Hence, $\frac{1}{9}$ of $\frac{6}{5}$ is $\frac{2}{15}$.

28. The lowest form of the product $2\frac{3}{7} \times \frac{7}{9}$ **is** _____

Solution:-

$$2\frac{3}{7} \times \frac{7}{9} = \frac{17}{7} \times \frac{7}{9}$$

$$= \frac{17}{9}$$

$$= 1\frac{8}{9}$$

Hence, the lowest form of the product $2\frac{3}{7} \times \frac{7}{9}$ is $1\frac{8}{9}$.

29. $\frac{4}{5} \div 4$ **is equal to** _____

Solution:-

$$\frac{4}{5} \div 4 = \frac{4}{5} \times \frac{1}{4}$$

$$= \frac{1}{5}$$

Hence, $\frac{4}{5} \div 4$ is equal to $\frac{1}{5}$.

30. $\frac{2}{5}$ **of 25 is** _____

Solution:-

$$\frac{2}{5} \text{ of } 25 = \frac{2}{5} \times 25$$

$$= \frac{2}{5} \times 25$$

$$= 2 \times 5$$

$$= 10$$

Hence, $\frac{2}{5}$ of 25 is 10.

31. $\frac{1}{5} \div \frac{5}{6} = \frac{1}{5}$ _____ $\frac{6}{5}$

Solution:-

$$\frac{1}{5} \div \frac{5}{6} = \frac{1}{5} \times \frac{6}{5}$$

32. 3.2 × 10 = _____

Solution:-

$3.2 \times 10 = \dfrac{32}{10} \times 10$

$\qquad = \underline{32}$

33. 25.4 × 1000 = _____

Solution:-

$25.4 \times 1000 = \dfrac{254}{10} \times 1000$

$\qquad = \underline{25400}$

34. 93.5 × 100 = _____

Solution:-

$93.5 \times 100 = \dfrac{935}{10} \times 100$

$\qquad = \underline{9350}$

35. 4.7 ÷ 10 = _____

Solution:-

$4.7 \div 10 = \dfrac{47}{10} \times 10$

$\qquad = \underline{47}$

36. 4.7 ÷ 100 = _____

Solution:-

$4.7 \div 100 = \dfrac{47}{10} \times 100$

$\qquad = \underline{470}$

37. 4.7 ÷ 1000 = _____

Solution:-

$4.7 \div 1000 = \dfrac{47}{10} \times 1000$

$\qquad = \underline{4700}$

38. The product of two proper fractions is _____ than each of the fractions that are multiplied.

Solution:-

The product of two proper fractions is <u>less</u> than each of the fractions that are multiplied.

39. While dividing a fraction by another fraction, we _____ the first fraction by the _____ of the other fraction.

Solution:-

While dividing a fraction by another fraction, we <u>multiply</u> the first fraction by the <u>reciprocal</u> of the other fraction.

40. 8.4 ÷ _____ = 2.1

Solution:-

Let $8.4 \div x = 2.1$

So,

$8.4 \times \dfrac{1}{x} = 2.1$

$x = \dfrac{8.4}{2.1}$

$x = \dfrac{84}{21}$

$x = 4$

Hence, $8.4 \div \underline{4} = 2.1$.

41. 52.7 ÷ _____ = 0.527

Solution:-

Let $52.7 \div x = 0.527$

So,

$527 \times \dfrac{1}{x} = 0.527$

$\dfrac{52.7}{10} \times \dfrac{1}{x} = \dfrac{527}{1000}$

$x = \dfrac{527}{527} \times \dfrac{1000}{10}$

$x = 100$

Hence, $52.7 \div \underline{100} = 0.527$.

42. 0.5 _____ 0.7 = 0.35

Solution:-

Let $0.5 \times 0.7 = 0.35$

$$\frac{5}{10} \times \frac{7}{10} = 0.35$$

$$\frac{35}{100} = 0.35$$

$$0.35 = 0.35$$

Hence, $0.5 \times 0.7 = 0.35$

43. 2 _____ $\dfrac{5}{3} = \dfrac{10}{3}$

Solution:-

Let $2 \times \dfrac{5}{3} = \dfrac{10}{3}$

$$\frac{10}{3} = \frac{10}{3}$$

Hence, $2 \times \dfrac{5}{3} = \dfrac{10}{3}$

44. 2.001 ÷ 0.003 = _____

Solution:-

$$2.001 \div 0.003 = \frac{2001}{1000} \div \frac{3}{1000}$$

$$= \frac{2001}{1000} \times \frac{1000}{3}$$

$$= 667$$

Hence, $.001 \div 0.003 = 667$.

In each of the Questions 45 to 54, state whether the statement is True or False.

45. The reciprocal of a proper fraction is a proper fraction.

Solution:-
The given statement is false because the reciprocal of a proper fraction is an improper fraction.

46. The reciprocal of an improper fraction is an improper fraction.

Solution:-
The given statement is false because the reciprocal of a improper fraction is a proper fraction.

47. Product of two fractions = $\dfrac{\text{Product of their denominators}}{\text{Product of their numerators}}$

Solution:-

The given statement is false because,

Product of two fractions $= \dfrac{\text{Product of their numerators}}{\text{Product of their denominators}}$

48. The product of two improper fractions is less than both the fractions.

Solution:-

The given statement is false because the product of two improper fractions is greater than both the fractions.

49. A reciprocal of a fraction is obtained by inverting it upside down.

Solution:-

The given statement is true because a reciprocal of a fraction is obtained by inverting it upside down.

50. To multiply a decimal number by 1000, we move the decimal point in the number to the right by three places.

Solution:-

As we know that to multiply a decimal number by 1000, we move the decimal point in the number to the right by three places.

Hence, the given statement is true.

51. To divide a decimal number by 100, we move the decimal point in the number to the left by two places.

Solution:-

As we know that to divide a decimal number by 100, we move the decimal point in the number to the left by two places.

Hence, the given statement is true.

52. 1 is the only number which is its own reciprocal.

Solution:-

As we know that 1 is the only number which is its own reciprocal.

Hence, the given statement is true.

53. $\dfrac{2}{3}$ of 8 is same as $\dfrac{2}{3} \div 8.$

Solution:-

$\dfrac{2}{3}$ of 8 is equal to $\dfrac{2}{3} \times 8$.

Hence, the given statement is false.

54. The reciprocal of $\dfrac{4}{7}$ is $\dfrac{4}{7}$.

Solution:-

The reciprocal of $\dfrac{4}{7}$ is $\dfrac{7}{4}$.

Hence, the given statement is false.

55. If 5 is added to both the numerator and the denominator of the fraction $\dfrac{5}{9}$, will the value of the fraction be changed? If so, will the value increase or decrease?

Solution:-

Given: $\dfrac{5}{9}$

According to the question,

$\dfrac{5+5}{9+5} = \dfrac{10}{14} = \dfrac{5}{7}$

Here, $\dfrac{5}{9} \neq \dfrac{5}{7}$

Therefore, the value is increased.

56. What happens to the value of a fraction if the denominator of the fraction is decreased while numerator is kept unchanged?

Solution:-

As we know that if the denominator of the fraction is decreased the value of a fraction is increased while the numerator remains unchanged.

57. Which letter comes $\dfrac{2}{5}$ of the way among A and J?

Solution:-

As we know that the total number between A and J is 10.

So, $\dfrac{2}{5} \times 10 = 4$

Therefore, D comes at $\dfrac{2}{5}$.

58. If $\dfrac{2}{3}$ of a number is 10, then what is 1.75 times of that number?

Solution:-
Let x be the number.
So,

$$\frac{2}{3} \times x = 10$$

$$x = 10 \times \frac{3}{2}$$

$$x = 5 \times 3$$

$$x = 15$$

Now, according to the question:
$1.75 \times 15 = 26.25$

59. In a class of 40 students, $\dfrac{1}{5}$ of the total number of students like to eat rice only, $\dfrac{2}{5}$ of the total number of students like to eat chapati only and the remaining students like to eat both. What fraction of the total number of students like to eat both?

Solution:-
Total number of students is 40.

Number of student who eats rice only $= \dfrac{1}{5} \times 40 = 8$

Number of student who eats chapatti only $= \dfrac{2}{5} \times 40 = 16$

Number of students who eats both $= 40 - (8+16)$
$= 16$

Therefore, the required fraction $= \dfrac{16}{40} = \dfrac{2}{5}$

60. Renu completed $\dfrac{2}{3}$ part of her homework in 2 hours. How much part of her homework had she completed in $1\dfrac{1}{4}$ hours?

Solution:-
Let total homework denoted as x.

Renu completed the part of homework in 2 hours $= \dfrac{2}{3}x$

So, completed work by her in an hour $= \dfrac{2}{3}x \div 2$

$$= \frac{2}{3} x \times \frac{1}{2}$$

$$= \frac{x}{3}$$

Now, the part of completed in $1\frac{1}{4}$ hours is calculated as follows:

$$= \frac{x}{3} \times 1\frac{1}{4}$$

$$= \frac{x}{3} \times \left(\frac{1 \times 4 + 1}{4} \right)$$

$$= \frac{x}{5} \times \frac{5}{4}$$

$$= \frac{5x}{12}$$

61. Reemu read $\frac{1}{5}$ th pages of a book. If she reads further 40 pages, she would have read $\frac{7}{10}$ th pages of the book. How many pages are left to be read?

Solution:-

Let total number of pages be x.

Number of pages read by Reemu $= \frac{1}{5} x$

Now, according to question:

$$\frac{1}{5} x + 40 = \frac{7}{10} x$$

$$\frac{7}{10} x - \frac{1}{5} x = 40$$

$$\left(\frac{7 - 2}{10} \right) x = 40$$

$$\frac{5}{10} x = 40$$

$$x = \frac{40 \times 10}{5}$$

$$x = 80$$

So, number of pages read by Reemu $= \frac{7}{10} \times 80 = 56$

Therefore, number of pages left to be read $= 80 - 56 = 24$

62. Write the number in the box □ such that

$$\frac{3}{7} \times \Box = \frac{15}{98}$$

Solution:-

Let the number in the box be a.

So,

$$\frac{3}{7} \times y = \frac{15}{98}$$

$$x = \frac{15}{98} \times \frac{7}{3}$$

$$x = \frac{5}{14}$$

Hence, the number in the box is $\frac{5}{14}$.

63. Will the quotient $7\frac{1}{6} \div 3\frac{2}{3}$ be a fraction greater than 1.5 or less than 1.5? Explain.

Solution:-

$$7\frac{1}{6} \div 3\frac{2}{3} = \left(\frac{7 \times 6 + 1}{6}\right) \div \left(\frac{3 \times 3 + 2}{3}\right)$$

$$= \frac{43}{6} \div \frac{11}{3}$$

$$= \frac{43}{6} \times \frac{3}{11}$$

$$= \frac{43}{22}$$

$$= 1.95$$

Hence, $7\frac{1}{6} \div 3\frac{2}{3}$ fraction is greater than 1.5.

64. Describe two methods to compare $\frac{13}{17}$ and 0.82. Which do you think is easier and why?

Solution:-

Method 1: Conversion of both numbers $\frac{13}{17}$ and 0.82 into fraction, get:

$$\frac{13}{17} = 0.76 \text{ and } 0.82$$

Method 2: Change into fraction

$$0.82 = \frac{82}{100} \text{ and } \frac{13}{17}$$

Therefore, the method 1, converting number in decimal is easy.

65. Health: The directions for a pain reliever recommend that an adult of 60 kg and overtake 4 tablets every 4 hours as needed, and an adult who weighs between 40 and 50 kg take only $2\frac{1}{2}$ tablets every 4 hours as needed. Each tablet weighs $\frac{4}{25}$ gram.

(a) If a 72 kg adult takes 4 tablets, how many grams of pain reliever is he or she receiving's?

(b) How many grams of pain reliever is the recommended dose for an adult weighing 46 kg?

Solution:-

(a) Weight of each tablets is $\frac{4}{25}$ grams.

So, weight of 4 tablets $= 4 \times \frac{4}{25} = \frac{16}{25}$ grams.

(b) Given in the question, an adult who weighs between 40 and 50 kg take only $2\frac{1}{2}$ tablets every 4 hours as needed.

So, weight of $2\frac{1}{2}$ grams tablets $= \frac{4}{25} \times 2\frac{1}{2}$

$$= \frac{4}{25} \times \left(\frac{2 \times 2 + 1}{2} \right)$$

$$= \frac{4}{25} \times \frac{5}{2}$$

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

66. Animals: The label on a bottle of pet vitamins lists dosage guidelines. What dosage would you give to each of these animals?
(a) a 18 kg adult dog
(b) a 6 kg cat
(c) a 18 kg pregnant dog

Do Good Pet Vitamins
- **Adult dogs:**

$\frac{1}{2}$ **tsp (tea spoon full) per 9 kg body weight**

- **Puppies, pregnant dogs, or nursing dogs:**

  $\frac{1}{2}$ **tsp per 4.5 kg body weight**

- **Cats:**

  $\frac{1}{4}$ **tsp per 1 kg body weight**

Solution:-

(a) Total dosage given to a 18kg adult dog $= \left(\frac{1}{2}+\frac{1}{2}\right)tsp = 1tsp$

(b) Total dosage given to a 6kg Cat

$= 6\times\frac{1}{4}\,sptsp = \frac{3}{22}\,tsp = 1\frac{1}{2}$

(c) Total dosage given to a 18kg pregnant dog

$= \frac{1}{2}\times\frac{1}{4.5}\times 18tsp = 9\times\frac{10}{45}\,tsp = 2$

67. How many $\frac{1}{16}$ kg boxes of chocolates can be made with $1\frac{1}{2}$ kg chocolates?

Solution:-

$\frac{1}{16}$ kg chocolates to be filled in 1 box.

So, 1kg chocolates to be filled in $1\div\frac{1}{16}$

$= 1\times 16 = 16$ boxes

Now, $1\frac{1}{2}$ kg chocolates to be filled in $= 16\times 1\frac{1}{2} = 16\times\frac{3}{2} = 24$ boxes.

68. Anvi is making bookmarker like the one shown in Fig. 2.6. How many bookmarker can she make from a 15 m long ribbon?
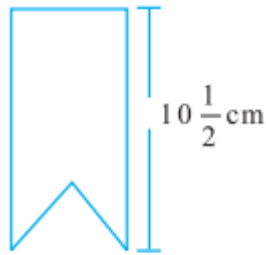
Fig. 2.6

Solution:-

Length of one bookmarker $= 10\dfrac{1}{2}$ cm

$$= \dfrac{10 \times 2 + 1}{2}$$

$$= \dfrac{21}{2} \text{ cm}$$

So, number of bookmarker Anvi can make from 15 m ix. 15×100 cm long ribbon

$$= \dfrac{1}{\dfrac{21}{2}} \times 15 \times 100$$

$$= \dfrac{2}{21} \times 1500$$

$$= \dfrac{3000}{21}$$

$$= 142.8$$

$$\approx 142$$

Hence, Anvi can make 142 bookmaker from a 15 cm long ribbon.

69. A rule for finding the approximate length of diagonal of a square is to multiply the length of a side of the square by 1.414. Find the length of the diagonal when:

(a) The length of a side of the square is 8.3 cm.

(b) The length of a side of the square is exactly 7.875 cm.

Solution:-

(a) Given: Length of a side of the square = 8.3 cm

So, length of the diagonal of the square

= 1.414 × 8.3 cm = 11.7362 cm

≈ 11.74 cm

(b) Given: Length of a side of the square = 7.875 cm

so, length of the diagonal of the square

= 1.414 × 7.875 cm

= 11.13525 cm

≈ 11.14 cm

70. The largest square that can be drawn in a circle has a side whose length is 0.707 times the diameter of the circle. By this rule, find the length of the side of such a square when the diameter of the circle is
(a) 14.35 cm   (b) 8.63 cm

Solution:-
(a) Given: Diameter of the circle = 14.35 cm

So, length of the side of the square

= 0.707 × 14.35 cm

= 10.14545 = 10.15 cm

(b) Given: Diameter of the circle = 8.63 cm

So, length of the side of the square

= 0.707 × 8.63 cm

= 6.10141 cm = 6.10 cm

71. To find the distance around a circular disc, multiply the diameter of the disc by 3.14. What is the distance around the disc when:
(a) the diameter is 18.7 cm?
(b) the radius is 6.45 cm?

Solution:-
(a) Given: Diameter of the disc = 18.7 cm

So, the distance around the disc

= 3.14 × 18.7 cm = 58.718 cm

(b) Given: Radius of the disc = 6.45 cm

So, diameter of the disc = 2 × 6.45 cm = 12.9 cm

Now, the distance around the disc

= 3.14 × 12.9 cm = 40.506 cm

72. What is the cost of 27.5 m of cloth at rupees 53.50 per metre?

Solution:-
Given: Cost of 1 metre of cloth = ₹ 53.50

So, cost of 27.5 metres of cloth = ₹ (53.50 × 27.5)

= ₹ 1471.25

73. In a hurdle race, Nidhi is over hurdle B and $\frac{2}{6}$ of the way through the race, as shown in Fig. 2.7.
Then, answer the following:

(a) Where will Nidhi be, when she is 4 6 of the way through the race?
(b) Where will Nidhi be when she is 5 6 of the way through the race?
(c) Give two fractions to tell what part of the race Nidhi has finished when she is over hurdle C.
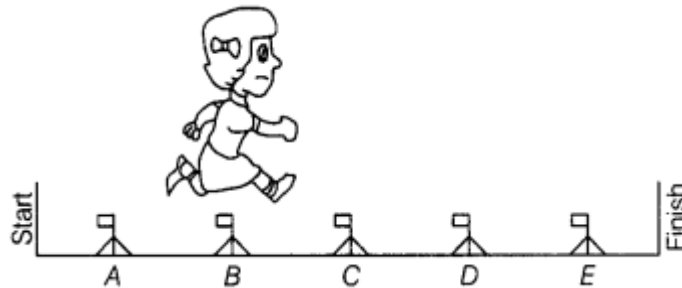
Solution:-

(a) When Nidhi is $\dfrac{4}{6}$ of the way through the race. So, she will be at hurdle D.

(b) When Nidhi is $\dfrac{5}{6}$ of the way through the race. So, she will be at hurdle E.

(c) When Nidhi is over hurdle C, she would finished the $\dfrac{3}{6}$ or $\dfrac{1}{2}$ or middle part of the race.

74. Diameter of Earth is 12756000m. In 1996, a new planet was discovered whose diameter is 5/86 of the diameter of Earth. Find the diameter of this planet in km.

Solution:-
Diameter of Earth = 12756000 m

Diameter of a new planet $= \dfrac{5}{86} \times 12756000\,\text{m}$

$\qquad\qquad\qquad\qquad\quad = 741627.90\ \text{m}$

That is equal to $\dfrac{741627.90}{1000}\,\text{km} = 741.6\text{km}$

75. What is the product of $\dfrac{5}{129}$ and it's reciprocal?

Solution:-

The reciprocal of $\dfrac{5}{129} = \dfrac{129}{5}$

So, $\dfrac{5}{129} \times \dfrac{129}{5} = 1$

76. Simplify: $\dfrac{2\frac{1}{2}+\frac{1}{5}}{2\frac{1}{2}\div\frac{1}{5}}$

Solution:-

$$\frac{2\frac{1}{2}+\frac{1}{5}}{2\frac{1}{2}\div\frac{1}{5}}=\frac{\frac{5}{2}+\frac{1}{5}}{\left(\frac{2\times2+1}{2}\right)\div\frac{1}{5}}$$

$$=\frac{\dfrac{5\times5+2}{10}}{\left(\dfrac{5}{2}\right)\times5}$$

$$=\frac{\dfrac{27}{10}}{\dfrac{25}{2}}$$

$$=\frac{27}{10}\times\frac{2}{25}$$

$$=\frac{27}{127}$$

77. Simplify: $\dfrac{\frac{1}{4}+\frac{1}{5}}{1-\frac{3}{8}\times\frac{3}{5}}$

Solution:-

$$\frac{\frac{1}{4}+\frac{1}{5}}{1-\frac{3}{8}\times\frac{3}{5}}=\frac{\dfrac{5+4}{20}}{\dfrac{40-9}{40}}$$

$$=\frac{\dfrac{9}{20}}{\dfrac{31}{31}}$$

$$=\frac{9}{20}\times\frac{40}{31}$$

$$=\frac{18}{31}$$

78. Divide $\dfrac{3}{10}$ **by** $\dfrac{1}{4}$ **of** $\dfrac{3}{5}$

Solution:-

$$\frac{3}{10} \div \left(\frac{1}{4} \text{ of } \frac{3}{5} \right) = \frac{3}{10} \div \left(\frac{1}{4} \times \frac{3}{5} \right)$$

$$= \frac{3}{10} \div \frac{3}{20}$$

$$= \frac{3}{10} \times \frac{20}{3}$$

$$= 2$$

79. $\dfrac{1}{8}$ **of a number equals** $\dfrac{2}{5} \div \dfrac{1}{20}$ **. What is the number?**

Solution:-

Let the number be x.

According to question,

$$\frac{1}{8} \times x = \frac{2}{5} \div \frac{1}{20}$$

$$\frac{x}{8} = \frac{2}{5} \times \frac{20}{1}$$

$$\frac{x}{8} = 8$$

$$x = 64$$

Therefore, the required number is 64.

80. Heena's father paid an electric bill of rupees 385.70 out of a 500 rupee note. How much change should he have received?

Solution:-

Given in the question: The amount of money Heena's father has = ₹ 500

He paid an electric bill of ₹ 385.70

So, the amount of money he should have received = ₹ (500 – 385.70) = ₹ 114.30

81. The normal body temperature is 98.6°F. When Savitri was ill her temperature rose to 103.1°F. How many degrees above normal was that?

Solution:-

Given: The normal body temperature = 98.6°F

Savitri's temperature, when she was ill = 103.1°F

So, Savitri's temperature above normal

= 103.1°F – 98.6°F

= 4.5°F

82. Meteorology: One measure of average global temperature shows how each year varies from a base measure. The table shows results for several years.

Year	1958	1964	1965	1978	2002
Difference from Base	0.10°C	−0.17°C	−0.10°C	$\left(\dfrac{1}{50}\right)^{o}C$	0.54°C

years from coldest to warmest.
(b) In 1946, the average temperature varied by –0.030C from the base measure. Between which two years should 1946 fall when the years are ordered from coldest to warmest?

Solution:-
(a) Order of five years from coldest to warmest is 1964, 1965, 1978, 1958, 2002
(b) In 1946, the average temperature varied by -0.03°C.

Since, $-0.10°C < -0.03°C < \left(\dfrac{1}{50}\right)°C$

So, 1946 should fall between 1965 and 1978.

83. In her science class, Jyoti learned that the atomic weight of Helium is 4.0030; of Hydrogen is 1.0080; and of Oxygen is 16.0000. Find the difference between the atomic weights of:
(a) Oxygen and Hydrogen
(b) Oxygen and Helium
(c) Helium and Hydrogen

Solution:-
Given in the question:
Atomic weight of Helium = 4.0030
Atomic weight of Hydrogen = 1.0080
Atomic weight of Oxygen – 16.0000

(a) Difference between the atomic weights of Oxygen and Hydrogen
= 16.0000 – 1.0080
= 14.9920

(b) Difference between atomic weights of Oxygen and Helium = 16.0000 – 4.0030 = 11.9970

(c) Difference between atomic weights of Helium and Hydrogen = 4.0030 – 1.0080 = 2.9950

84. Measurement made in science lab must be as accurate as possible. Ravi measured the length of an iron rod and said it was 19.34 cm long; Kamal said 19.25 cm; and Tabish said 19.27 cm. The correct length was 19.33 cm. How much of error was made by each of the boys?

Solution:-
Given in the question:
The correct length of the iron rod = 19.33 cm
The length of the rod measured by Ravi = 19.34 cm
So, error made by Ravi = (19.34 – 19.33)cm = +0.01 cm
Now, the length of the rod measured by Kamal = 19.25 cm
So, error made by Kamal = (19.25 – 19.33) cm = -0.08 cm
Now, the length of the rod measured by Tabish = 19.27 cm
So, error made by Tabish = (19.27 – 19.33) cm = -0.06 cm.

85. When 0.02964 is divided by 0.004, what will be the quotient?

Solution:-
According to the question:
$$0.02964 \div 0.004 = \frac{2964}{100000} \div \frac{4}{1000}$$
$$= \frac{2964}{100000} \times \frac{1000}{4}$$
$$= \frac{741}{100}$$
$$= 7.41$$

86. What number divided by 520 gives the same quotient as 85 divided by 0.625?

Solution:-
Let a number x be divided by 520.
Now, according to question:
$$x \div 520 = 85 \div 0.625$$
$$\frac{x}{520} = \frac{85}{0.625}$$
$$x = \frac{85 \times 520}{0.625}$$
$$x = \frac{44200}{625} \times 1000$$
$$x = 70.72 \times 1000$$
$$x = 70720$$
Therefore, the required number is 70720.

87. A floor is 4.5 m long and 3.6 m wide. A 6 cm square tile costs rupees 23.25. What will be the cost to cover the floor with these tiles?

Solution:-
Given: Length of the floor = 4.5 m
= (4.5 × 100) cm = 450 cm
Width of the floor – 3.6 m – (3.6 × 100) cm = 360 cm
So, Area of the floor – (450 × 360) cm^2 = 162000 cm^2
Side of a square tile = 6 cm
So, Area of one square tile = (6 × 6) cm^2 = 36 cm^2

$$\text{Number of tiles required to cover the floor} = \frac{\text{Area of floor}}{\text{Area of one tile}}$$
$$= \frac{162000}{36}$$
$$= 4500$$

Now, cost of one tile = ₹ 23.25
So, Cost of 4500 tiles = ₹ (23.25 × 4500)
= ₹ 104625

88. Sunita and Rehana want to make dresses for their dolls. Sunita has $\frac{3}{4}$ m of cloth, and she gave $\frac{1}{3}$ of it to Rehana. How much did Rehana have?

Solution:-
Given: Length of cloth Sunita has $\frac{3}{4}$ m

So, length of cloth Rehana has $= \frac{1}{3}$ of $\frac{3}{4}$ m
$$= \frac{1}{3} \times \frac{3}{4} \text{ m}$$
$$= \frac{1}{4} \text{ m}$$

89. A flower garden is 22.50 m long. Sheela wants to make a border along one side using bricks that are 0.25 m long. How many bricks will be needed?

Solution:-
Given: Length of the garden = 22.50 m
Length of one brick = 0.25 m

So, number of bricks required to make the border $= \dfrac{\text{Length of the graden}}{\text{Length of one brick}}$

$$= \dfrac{22.50}{0.25}$$

$$= \dfrac{2250}{25}$$

$$= 90$$

90. How much cloth will be used in making 6 shirts, if each required $2\dfrac{1}{4}$ m of cloth, allowing $\dfrac{1}{8}$ m for waste in cutting and finishing in each shirt?

Solution:-

Length of cloth required for one shirt $= 2\dfrac{1}{4}\,\text{m} + \dfrac{1}{8}\,\text{m}$

$$= \left(\dfrac{9}{4} + \dfrac{1}{8}\right)\text{m}$$

$$= \left(\dfrac{18+1}{8}\right)\text{m}$$

$$= \dfrac{19}{8}\,\text{m}$$

So, Length of cloth required for 6 shirts $= \dfrac{19}{8}\,\text{m} \times 6$

$$= \dfrac{19 \times 3}{4}\,\text{m}$$

$$= \dfrac{57}{4}\,\text{m}$$

$$= 14\dfrac{1}{4}\,\text{m}$$

91. A picture hall has seats for 820 persons. At a recent film show, one usher guessed it was $\dfrac{3}{4}$ full, another that it was $\dfrac{2}{3}$ full. The ticket office reported 648 sales. Which usher (first or second) made the better guess?

Solution:-

Given: Total number of seats = 820
Sale of total tickets = 648

Number of sold tickets guessed by first usher$= \dfrac{3}{4} \times 820$

=615

Number of sold tickets guessed by second usher $= \dfrac{2}{3} \times 820$

$$= \dfrac{1640}{3}$$
$$= 546.66$$
$$\approx 547$$

Therefore, 615 is more close to 648 than 547.
So, first usher made the better guess.

92. For the celebrating children's students of Class VII bought sweets for rupees 740.25 and cold drink for rupees 70. If 35 students contributed equally what amount was contributed by each student?

Solution:-
According to the question:
Total spending amount = ₹740.25 + ₹70
= ₹ 3810.25
Total number of students who contributed money = ₹ 35

So, contribution of each student $= ₹ \dfrac{810.25}{35}$

$$= ₹ \ 23.15$$

93. The time taken by Rohan in five different races to run a distance of 500 m was 3.20 minutes, 3.37 minutes, 3.29 minutes, 3.17 minutes and 3.32 minutes. Find the average time taken by him in the races.

Solution:-
Total time taken by Rohan in five races
= (3.20 +3.37 +3.29 +3.17 +3.32] minutes
= 16.35 minutes
Total number of races = 5
So, The average time taken by Rohan
$= \dfrac{16.35}{5}$ minutes
= 3.27 minutes

94. A public sewer line is being installed along $80\dfrac{1}{4}$ m of road. The supervisor says that the labourers will be able to complete 7.5 m in one day. How long will the project take to complete?
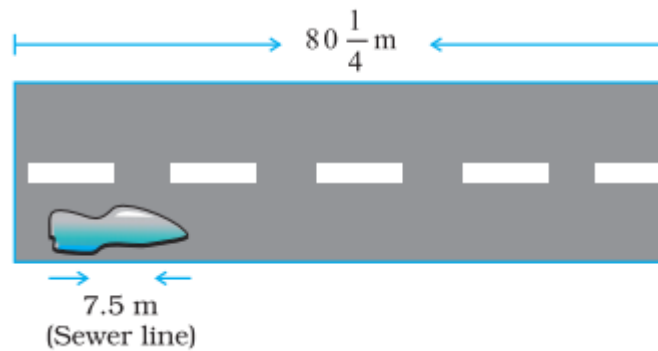
Solution:-

Total length of a sewer line $= 80\dfrac{1}{4}$ m

$$= \dfrac{321}{4}\,m$$

7.5 m long sewer line completed in 1 day.

So, $\dfrac{321}{4}$ m long sewer line completed in $= \dfrac{1}{7.5} \times \dfrac{321}{4}$

$$= \dfrac{10}{75} \times \dfrac{321}{4}$$

$$= \dfrac{3210}{300}$$

$$= 10.7$$

$$= 11\ \text{days}$$

95. The weight of an object on moon is $\dfrac{1}{6}$ its weight on Earth. If an object weighs $5\dfrac{3}{5}$ kg on Earth, how much would it weigh on the moon?

Solution:-

Given: Weight of the object on Earth $= 5\dfrac{3}{5}\,kg$

$$= \dfrac{28}{5}\,kg$$

So, weight of that object on Moon $= \dfrac{1}{6} \times \dfrac{28}{5}\,kg$

$$= \dfrac{1}{6} \times \dfrac{28}{5}\,kg$$

$$= \dfrac{14}{15}\,kg$$

$$= 0.93\,kg$$

96. In a survey, 200 students were asked what influenced them most to buy their latest CD. The results are shown in the circle graph.
(a) How many students said radio influenced them most?
(b) How many more students were influenced by radio than by a music video channel?
(c) How many said a friend or relative influenced them or they heard the CD in a shop?
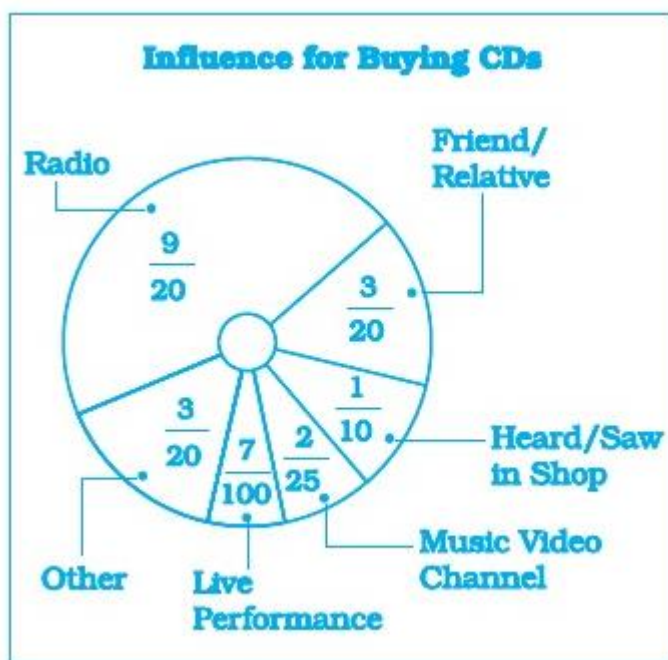
Solution:-

(a) Number of students who were influenced by radio $= \dfrac{9}{25} \times 200$
$$= 90$$

(b) Number of students who were influenced by music video channel $= \dfrac{2}{25} \times 200$
$$= 16$$
Number of students who were influenced by radio $= 90$
Hence, $90 - 16 = 74$ more students were influenced by radio than by a music video channel.

(c) Number of students who were influenced by friend or relative $= \dfrac{3}{20} \times 200$
$$= 30$$

Number of students who were influenced by hearing or seeing the CD in a shop $= \dfrac{3}{20} \times 200$
$$= 30$$

So, total number of students who were influenced by both friend or relative and hearing the CD in a shop $= 30 + 20 = 50$

97. In the morning, a milkman filled $5\frac{1}{2}$ L of milk in his can. He sold to Renu, Kamla and Renuka $\frac{3}{4}$ L each; to Shadma he sold $\frac{7}{8}$ L; and to Jassi he gave $1\frac{1}{2}$ L. How much milk is left in the can?

Solution:-

Given: Total quantity of milk in the can $= 5\frac{1}{2} L$

$$= \frac{5 \times 2 + 1}{2} L$$

$$= \frac{10 + 1}{2} L$$

$$= \frac{11}{2} L$$

$$= 5\frac{1}{2} L = \frac{11}{2} L$$

Total quantity of milk to be sold to different persons $= \left(\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{7}{8} + 1\frac{1}{2} \right) L$

$$= \left(\frac{9}{4} + \frac{7}{8} + \frac{3}{2} \right) L$$

$$= \left(\frac{18 + 7 + 12}{8} \right) L$$

$$= \frac{37}{8} L$$

Therefore, quantity of milk left in the can $= \left(\frac{11}{2} - \frac{37}{8} \right) L$

$$= \frac{44 - 37}{8} L$$

$$= \frac{7}{8} L$$

98. Anuradha can do a piece of work in 6 hours. What part of the work can she do in 1 hour, in 5 hours, in 6 hours?

Solution:-

Let whole work be represented by W.

So, the part of work done by Anuradha in 6 hours = W

Now, the part of work done by her in 1 hour $= \frac{W}{6}$

So, the part of work done by her in 5 hours $= \frac{W}{6} \times 5$

$$= \frac{5}{6}W$$

Now, the part of work done by her in 6 hours $= \dfrac{W}{6} \times 6$

$$= W$$

Therefore, Anuradha can do $\dfrac{1}{6}$ part of work in 1 hour, $\dfrac{5}{6}$ part of work in 5 hours and complete work in 6 hours.

99. What portion of a 'saree' can Rehana paint in 1 hour if it requires 5 hours to paint the whole saree? In $4\dfrac{3}{5}$ hours? In $3\dfrac{1}{2}$ hours?

Solution:-

In 5h, Rehana paints = Whole saree

In 1 h, she paints $= \dfrac{1}{5}$ part of saree

In $3\dfrac{1}{2}h$, she paints $= \dfrac{1}{5} \times 3\dfrac{1}{2}$

$$= \frac{1}{5} \times \left(\frac{3 \times 2 + 1}{2} \right)$$

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

$$= \frac{7}{10} \text{ part of saree}$$

100. Rama has $6\dfrac{1}{4}$ kg of cotton wool for making pillows. If one pillow takes $1\dfrac{1}{4}$ kg, how many pillows can she make?

Solution:-

Given:

Given: Total quantity of cotton wool $= 6\dfrac{1}{4}$ kg

$$= \frac{6 \times 4 + 1}{4} \text{ kg}$$

$$= \frac{25}{4} \text{ kg}$$

Quantity of cotton wool required for one pillow $= 1\dfrac{1}{4}$ kg

$$= \frac{4 \times 1 + 1}{4} \text{kg}$$

$$= \frac{5}{4} \text{kg}$$

So, required number of pillows $= \frac{25}{4} \div \frac{5}{4}$

$$= \frac{25}{4} \times \frac{4}{5}$$

$$= 5$$

101. It takes $2\frac{1}{3}$ m of cloth to make a shirt. How many shirts can Radhika make from a piece of cloth $9\frac{1}{3}$ m long?

Solution:-

Given: Total length of cloth $= 9\frac{1}{3}$ m

$$= \frac{9 \times 3 + 1}{3} \text{m}$$

$$= \frac{28}{3} \text{m}$$

Length of the cloth required for one shirt $= 2\frac{1}{3}$ m

$$= \frac{2 \times 3 + 1}{3} \text{m}$$

$$= \frac{7}{3} \text{m}$$

So, required number of shirts $= \frac{28}{3} \div \frac{7}{3}$

$$= \frac{28}{3} \times \frac{3}{7}$$

$$= 4$$

102. Ravi can walk $3\frac{1}{3}$ km in one hour. How long will it take him to walk to his office which is 10 km from his home?

Solution:-

Given: time taken by ravi to walk $3\frac{1}{3}$ km $= 1$ hour

So, time taken by him to walk 1 km $= \left(1 \div \frac{10}{3}\right)$ hours

$$= \left(1 \div \frac{3 \times 3 + 1}{3}\right) \text{hours}$$

$$= \left(1 \times \frac{3}{10}\right) \text{hours}$$

$$= \frac{3}{10} \text{hours}$$

So, time taken by him to walk 10 km $= \left(\frac{3}{10} \times 10\right)$ hours

$$= 3 \text{ hours}$$

103. Raj travels 360 km on three fifths of his petrol tank. How far would he travel at the same rate with a full tank of petrol?

Solution:-

Distance travelled by Raj with $\frac{3}{5}$ petrol tank = 360 km

Distance travelled by him with a full petrol tank $= \left(360 \div \frac{3}{5}\right) \text{km}$

$$= \frac{360 \times 5}{3} \text{km}$$

$$= 120 \times 5 \text{km}$$

$$= 600 \text{km}$$

104. Kajol has rupees 75. This is 3/8 of the amount she earned. How much did she earn?

Solution:-

Let money earned by Kajol be ₹ x.

So, according to question,

$$\frac{3}{8} \times x = 75$$

$$x = 75 \times \frac{8}{3}$$

$x = 200$

So, the amount earned by Kajol is ₹ 200.

105. It takes 17 full specific type of trees to make one tonne of paper. If there are 221 such trees in a forest, then (i) what fraction of forest will be used to make;

(a) 5 tonnes of paper.   (b) 10 tonnes of paper.

(ii) To save $\frac{7}{13}$ part of the forest how much of paper we have to save.

Solution:-

(i) Number of trees required to make 1 tonne of paper = 17
Total number of trees = 221

So, fraction of forest will be used to make one tonne of paper $= \dfrac{17}{221}$

$= \dfrac{1}{13}$

(a) fraction of forest will be used to make 5 tonnes of paper $= \dfrac{1}{13} \times 5$

$= \dfrac{5}{13}$

(b) Fraction of forest will be used to make 10 tonnes of paper $= \dfrac{1}{13} \times 10$

$= \dfrac{10}{13}$

(ii) Let we have to save x tonnes of paper to save $\dfrac{7}{13}$ part of forest

Fraction of forest will be used to make x tonnes of paper $= \dfrac{1}{13} \times x$

$= \dfrac{x}{13}$

Now, $\dfrac{x}{13} = \dfrac{7}{13}$

$x = \dfrac{7}{13} \times 13$

$x = 7$

106. Simplify and write the result in decimal form:

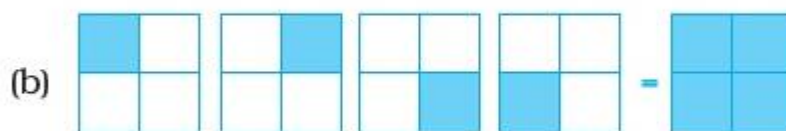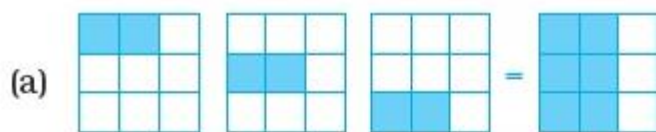$$\left(1 \div \frac{2}{9}\right) + \left(1 \div 3\frac{1}{5}\right) + \left(1 \div 2\frac{2}{3}\right)$$

Solution:-
Simplify the given expression as follows:

$$\left(1 \div \frac{2}{9}\right) + \left(1 \div 3\frac{1}{5}\right) + \left(1 \div 2\frac{2}{3}\right) = \left(1 \div \frac{2}{9}\right) + \left(1 \div \frac{3 \times 5 + 1}{5}\right) + \left(1 \div \frac{3 \times 2 + 2}{3}\right)$$

$$= \left(1 \div \frac{2}{9}\right) + \left(1 \div \frac{16}{5}\right) + \left(1 \div \frac{8}{3}\right)$$

$$= \left(1 \times \frac{9}{2}\right) + \left(1 \times \frac{5}{16}\right) + \left(1 \times \frac{3}{8}\right)$$

$$= \frac{9}{2} + \frac{5}{16} + \frac{3}{8}$$

$$= \frac{72 + 5 + 6}{16}$$

$$= \frac{83}{16}$$

$$= 5.1875$$

107. Some pictures (a) to (f) are given below. Tell which of them show:

(1) $2 \times \frac{1}{4}$　　**(2) $2 \times \frac{3}{7}$**　　**(3) $2 \times \frac{1}{3}$**　　**(4) $\frac{1}{4} \times 4$**　　**(5) $3 \times \frac{2}{9}$**　　**(6) $\frac{1}{4} \times 3$**
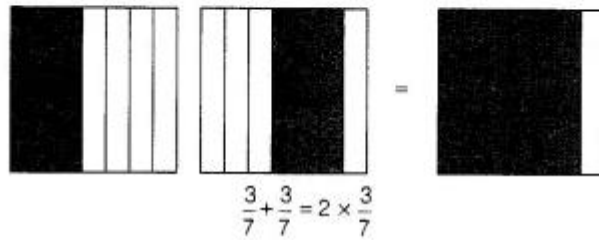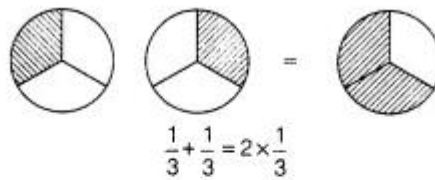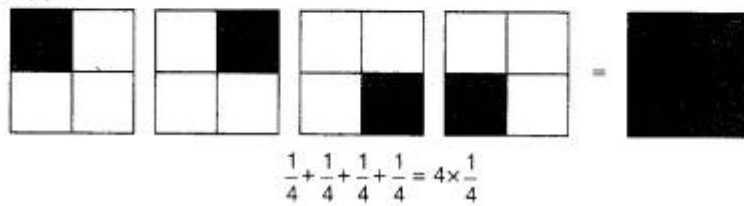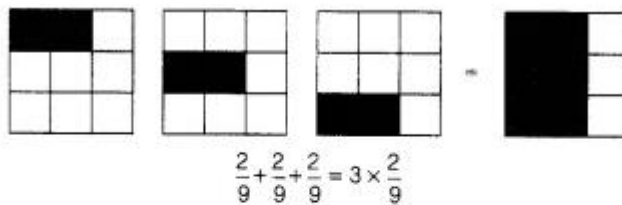
Solution:-

(1) → (d)

$$\frac{1}{4} + \frac{1}{4} = 2 \times \frac{1}{4}$$

(2) → (f)

$$\frac{3}{7} + \frac{3}{7} = 2 \times \frac{3}{7}$$

(3) → (c)

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

(4) → (b)

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 4 \times \frac{1}{4}$$

(5) → (a)

$$\frac{2}{9} + \frac{2}{9} + \frac{2}{9} = 3 \times \frac{2}{9}$$

(6) → (e)

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 3 \times \frac{1}{4}$$
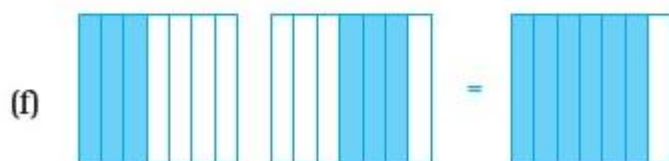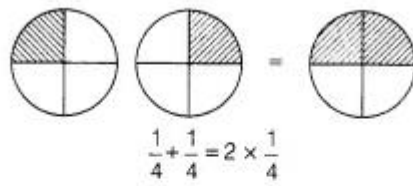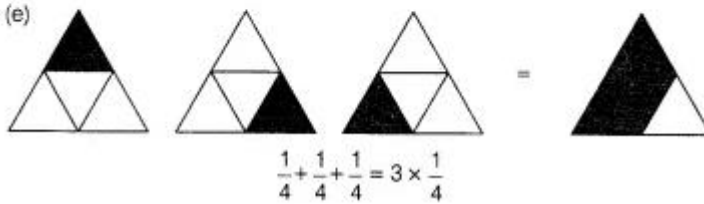
108. Evaluate: $(0.3) \times (0.3) - (0.2) \times (0.2)$

Solution:-
Evaluating the given expression as follows:

$$(0.3) \times (0.3) - (0.2) \times (0.2) = \left(\frac{3}{10} \times \frac{3}{10} \right) - \left(\frac{2}{10} \times \frac{2}{10} \right)$$

$$= \frac{9}{100} - \frac{4}{100}$$

$$= \frac{9-4}{100}$$

$$= \frac{5}{100}$$

$$= 0.05$$

109. Evaluate: $\dfrac{0.6}{0.3} + \dfrac{0.16}{0.4}$

Solution:-

Evaluating the given expression as follows:

$$\frac{0.6}{0.3} + \frac{0.16}{0.4} = \frac{0.6}{0.3} + \frac{0.16}{0.40}$$

$$= \frac{6}{3} + \frac{16}{40}$$

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

$$= \frac{10+2}{5}$$

$$= \frac{12}{5}$$

$$= 2.4$$

110. Find the value of: $\dfrac{(0.2 \times 0.14) + (0.5 \times 0.91)}{(0.1 \times 0.2)}$

Solution:-

Simplify the given expression as follows:

$$\frac{(0.2 \times 0.14) + (0.5 \times 0.91)}{0.1 \times 0.2} = \frac{\dfrac{2}{10} \times \dfrac{14}{100} + \dfrac{5}{10} \times \dfrac{91}{100}}{\dfrac{1}{10} \times \dfrac{2}{10}}$$

$$= \frac{\dfrac{2 \times 14}{1000} + \dfrac{5 \times 91}{1000}}{\dfrac{1 \times 2}{100}}$$

$$= \frac{\dfrac{28}{1000} + \dfrac{455}{1000}}{\dfrac{2}{100}}$$

$$= \frac{\dfrac{28 + 455}{1000}}{\dfrac{2}{100}}$$

$$= \frac{\dfrac{483}{1000}}{\dfrac{2}{100}}$$

$$= \frac{483}{1000} \times \frac{100}{2}$$

$$= \frac{483}{\underset{2}{10 \times 2}}$$

$$= \frac{41.5}{10}$$

$$= 24.15$$

111. A square and an equilateral triangle have a side in common. If side of triangle is $\frac{4}{3}$ cm long, find the perimeter of figure formed (Fig. 2.8).
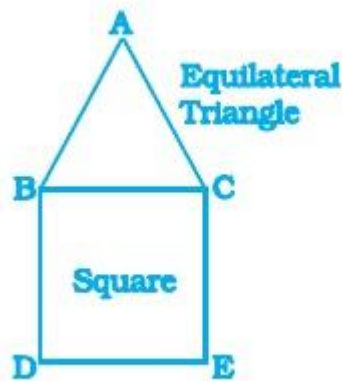

Fig. 2.8

Solution:-

Side of the equilateral triangle $= \frac{4}{3}$ cm

So, side of the square $= \frac{4}{3}$ cm

Now, perimeter of given figure $= \left(\frac{4}{3} + \frac{4}{3} + \frac{4}{3} + \frac{4}{3} + \frac{4}{3} \right)$ cm

$$= 5 \times \frac{4}{3} \text{ cm}$$

$$= \frac{20}{3} \text{ cm}$$

$$= 6\frac{2}{3} \text{ cm}$$

112. Rita has bought a carpet of size 4 m × $6\frac{2}{3}$ m. But her room size is $3\frac{1}{3}$ m × $5\frac{1}{3}$ m. What fraction of area should be cut off to fit wall to wall carpet into the room?

Solution:-

Given: Area of the carpet $= 4 \times 6\frac{2}{3} \text{ m}^2$

$$= 4 \times \frac{20}{3} \text{ m}^2$$

$$= \frac{80}{3} \text{ m}^2$$

Area of the room $= 3\frac{1}{3} \times 5\frac{1}{3} \text{ m}^2$

$$= \frac{10}{3} \times \frac{16}{3} \text{ m}^2$$

$$= \frac{160}{9} \text{ m}^2$$

So, area to be cut off $= \left(\frac{80}{3} - \frac{160}{9} \right) \text{ m}^2$

113. Family photograph has length $14\frac{2}{5}$ cm and breadth $10\frac{2}{5}$ cm. It has border of uniform width $2\frac{3}{5}$ cm. Find the area of framed photograph.

Solution:-

Given: Length of photograph $= 14\frac{2}{5} \text{ cm}$

$$= \frac{72}{5} \text{ cm}$$

Breadth of photograph $= 10\frac{2}{5} \text{ cm}$

$$= \frac{52}{5} \text{ cm}$$

Width of border $= 2\dfrac{3}{5}$ cm $= \dfrac{13}{5}$ cm

So, length of framed photograph $= \left(\dfrac{72}{5} + \dfrac{13}{5} + \dfrac{13}{5}\right)$ cm

$$= \dfrac{98}{5} \text{ cm}$$

Also, breadth of framed photograph $= \left(\dfrac{52}{5} + \dfrac{13}{5} + \dfrac{13}{5}\right)$ cm

$$= \dfrac{78}{5} \text{ cm}$$

So, area of framed photograph $= \dfrac{98}{5} \times \dfrac{78}{5}$ cm^2

$$= \dfrac{7644}{25} \text{ cm}^2$$

$$= 305\dfrac{19}{25} \text{ cm}^2$$

114. Cost of a burger is rupees $20\dfrac{3}{4}$ and of Macpuff is rupees $15\dfrac{1}{2}$. Find the cost of 4 burgers and 14 macpuffs.

Solution:-

Given: cost of a burger = Rs. $20\dfrac{3}{4}$ = Rs. $\dfrac{83}{4}$

Cost of a macpuff = Rs. $15\dfrac{1}{2}$ = Rs. $\dfrac{31}{2}$

So, Cost of 4 burgers = Rs. $\left(4 \times \dfrac{83}{4}\right)$ = Rs. 83

And cost of 14 macpuffs = Rs. $\left(14 \times \dfrac{31}{2}\right)$ = Rs. (7×31) = Rs. 217

So, cost of 4 burgers and 14 macpuffs = Rs. (83+217) = Rs. 300

115. A hill, $101\dfrac{1}{3}$ m in height, has $\dfrac{1}{4}$ th of its height under water. What is the height of the hill visible above the water?

Solution:-

Given: Total height of the hill = $101\dfrac{1}{3}$ m = $\dfrac{304}{3}$ m

Height of the hill under water = $= \dfrac{1}{4} \times \dfrac{304}{3}$ m $= \dfrac{76}{3}$ m

So, height of the hill visible above the water $= \left(\dfrac{304}{3} - \dfrac{76}{3} \right) m = \dfrac{228}{3} m = 76m$

116. Sports: Reaction time measures how quickly a runner reacts to the starter pistol. In the 100 m dash at the 2004 Olympic Games, Lauryn Williams had a reaction time of 0.214 second. Her total race time, including reaction time, was 11.03 seconds. How long did it take her to run the actual distance?

Solution:-
Total race time of Lauryn Williams = 11.03 seconds
Her reaction time = 0.214 second
So, time taken by her to run the actual distance = (11.03 – 0.214) seconds
$\hspace{5cm}$ = 10.816 seconds

117. State whether the answer is greater than 1 or less than 1. Put a 'ü' mark in appropriate box.

Questions	Greater than 1	Less than 1
$\dfrac{2}{3} \div \dfrac{1}{2}$		
$\dfrac{2}{3} \div \dfrac{2}{1}$		
$6 \div \dfrac{1}{4}$		
$\dfrac{1}{5} \div \dfrac{1}{2}$		
$4\dfrac{1}{3} \div 3\dfrac{1}{2}$		
$\dfrac{2}{3} \times 8\dfrac{1}{2}$		

Solution:-

(i) $\quad \dfrac{2}{3} \div \dfrac{1}{2} = \dfrac{2}{3} \times \dfrac{2}{1} = \dfrac{4}{3} > 1$

(ii) $\quad \dfrac{2}{3} \div \dfrac{2}{1} = \dfrac{2}{3} \times \dfrac{1}{2} = \dfrac{1}{3} < 1$

(iii) $\quad 6 \div \dfrac{1}{4} = 6 \times 4 = 24 > 1$

(iv) $\dfrac{1}{5} \div \dfrac{1}{2} = \dfrac{1}{5} \times \dfrac{2}{1} = \dfrac{2}{5} < 1$

(v) $4\dfrac{1}{3} + 3\dfrac{1}{2} = \dfrac{13}{3} \div \dfrac{7}{2} = \dfrac{13}{3} \times \dfrac{2}{7} = \dfrac{26}{21} > 1$

(vi) $\dfrac{2}{3} \times 8\dfrac{1}{2} = \dfrac{2}{3} \times \dfrac{17}{2} = \dfrac{17}{3} > 1$

Questions	Greater than 1	Less than 1
$\dfrac{2}{3} \div \dfrac{1}{2}$	✓	
$\dfrac{2}{3} \div \dfrac{2}{1}$		✓
$6 \div \dfrac{1}{4}$	✓	
$\dfrac{1}{5} \div \dfrac{1}{2}$		✓
$4\dfrac{1}{3} \div 3\dfrac{1}{2}$	✓	
$\dfrac{2}{3} \times 8\dfrac{1}{2}$	✓	

118. There are four containers that are arranged in the ascending order of their heights. If the height of the smallest container given in the figure is expressed as $\dfrac{7}{25} x = 10.5$ cm. Find the height of the largest container.

Solution:-
Given: Height of the smallest container = 10.5 cm
Now, according to the question:

$$\frac{7}{25}x = 10.5$$

$$x = 10.5 \times \frac{25}{7}$$

$$x = \frac{105}{10} \times \frac{25}{7}$$
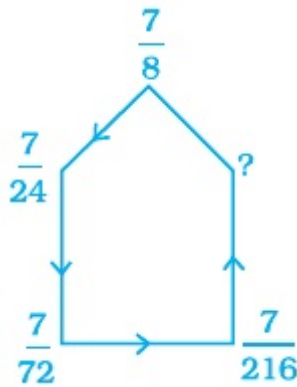
$$x = \frac{15 \times 25}{10}$$

$$x = \frac{375}{10}$$

$$x = 37.5$$

So, Height of the largest container is 37.5 cm.

In Questions 119 to 122, replace '?' with appropriate fraction.
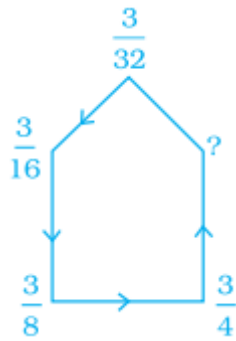
119.

Solution:-

See the given figure, the pattern is:

$$\frac{7}{8}, \frac{7}{8 \times 3} = \frac{7}{24}, \frac{7}{24 \times 3} = \frac{7}{72}, \frac{7}{72 \times 3} = \frac{7}{216}$$

So, Next fraction is $\dfrac{7}{216 \times 3} = \dfrac{7}{648}$.
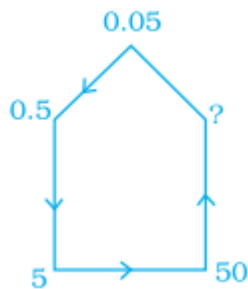
120.

Solution:-

See the given figure, the pattern is:

$$\frac{3}{32}, \frac{3}{32} \times 2 = \frac{3}{16}, \frac{3}{16} \times 2 = \frac{3}{8}, \frac{3}{8} \times 2 = \frac{3}{4}$$

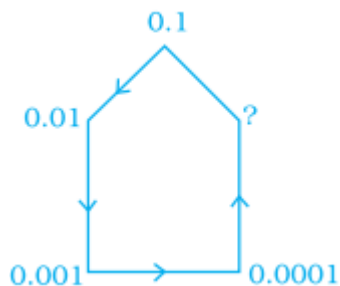So, Next fraction is $\dfrac{3}{4} \times 2 = \dfrac{3}{2}$.

121.

Solution:-

See the given figure, the pattern is:

$0.05, 0.05 \times 10 - 0.5, 0.5 \times 10 - 5, 5 \times 10 = 50$

So, Next number will be $50 \times 10 = 500$.

122.

Solution:-

See the given figure, the pattern is:

$$0.1, \frac{0.1}{10} = 0.01, \frac{0.01}{10} = 0.001, \frac{0.001}{10} = 0.0001$$

So, Next fraction is $\dfrac{0.0001}{10} = 0.00001$.

What is the Error in each of question 123 to 125?

123. A student compared $-\dfrac{1}{4}$ and –0.3. He changed $-\dfrac{1}{4}$ to the decimal – 0.25 and wrote, "Since 0.3 is greater than 0.25, –0.3 is greater than –0.25". What was the student's error?

Solution:-
As 0.3 is greater than 0.25.
So, -0.3 is less than -0.25
Hence, the error is -0.30 >-0.25

124. A student multiplied two mixed fractions in the following manner: $2\dfrac{4}{7} \times 3\dfrac{1}{4} = 6\dfrac{1}{7}$. What error the student has done?

Solution:-
For multiplying two mixed fraction, convert them into omproper fraction.
So,

$$2\dfrac{4}{7} \times 3\dfrac{1}{4} = \dfrac{2 \times 7 + 4}{7}$$

$$= \dfrac{3 \times 4 + 1}{4}$$

$$= \dfrac{18}{7} \times \dfrac{13}{4}$$

$$= \dfrac{117}{14}$$

$$= 8\dfrac{5}{14}$$

125. In the pattern $\dfrac{1}{3} + \dfrac{1}{4} + \dfrac{1}{5} + \;.....$ which fraction makes the sum greater than 1 (first time)? Explain.

Solution:-
Case 1: $\dfrac{1}{3} + \dfrac{1}{4} + \dfrac{1}{5} = \dfrac{20 + 15 + 12}{60} = \dfrac{47}{60}$
Which is less than 1.

Case 2: $\dfrac{1}{3}+\dfrac{1}{4}+\dfrac{1}{5}+\dfrac{1}{6}=\dfrac{20+15+12+10}{60}=\dfrac{57}{60}$

Which is less than 1.

Case 3: $\dfrac{1}{3}+\dfrac{1}{4}+\dfrac{1}{5}+\dfrac{1}{6}+\dfrac{1}{7}=\dfrac{140+105+84+70+60}{420}=\dfrac{459}{420}$

Which is greater than 1.