EXERCISE 2.1

1. Solve the following equations and verify the answers :

(a) $5x + 3 = 2x$

(b) $\dfrac{7x}{5} = 10$

(c) $5x + 7 = 3x + 11$

(d) $-3(2x + 2) = 5(x - 3) - 2$

(e) $\dfrac{2}{3}x + \dfrac{1}{2}(x - 5) = 3$

(f) $\dfrac{7x}{5} + 1 = \dfrac{2x}{3} + \dfrac{1}{2}$

(g) $\dfrac{7y}{3} - \dfrac{2}{5} = \dfrac{2y}{5} - \dfrac{2}{3}$

2. Solve the following equations :

(a) $x + 9 - \dfrac{3x}{5} = \dfrac{x}{2} - 3$

(b) $\dfrac{2x - 5}{3} + \dfrac{3x - 2}{2} = 1$

(c) $x - \dfrac{2x - 3}{2} = 1 - \dfrac{3x - 2}{3}$

(d) $\dfrac{3x - 5}{5} - \dfrac{7x - 2}{2} = 5$

(e) $4(4.5x - 3.5) = 2.5x + 15$

(f) $0.7(0.25x - 0.3) = 0.05(0.2x - 3)$

EXERCISE 2.2

Solve the following equations :

1. $\dfrac{7x-3}{2} = \dfrac{-2}{3}$

2. $\dfrac{2x-5}{3} + \dfrac{3}{5} = 0$

3. $\dfrac{7x-3}{5x-2} = -2$

4. $\dfrac{3x+1}{x-2} = \dfrac{-6}{11}$

5. $\dfrac{z+9}{3(z+5)} = -2$

6. $\dfrac{5y-2}{4(y+2)} = \dfrac{1}{3}$

7. $m - \dfrac{m-1}{2} = 1 - \dfrac{m-2}{3}$

8. $\dfrac{3t-2}{4} - \dfrac{2t+3}{3} = \dfrac{2}{3} - t$

9. $\dfrac{2x+1}{3} + 1 = \dfrac{x-4}{6}$

EXERCISE 2.3

1. Think of a number. Multiply the number by $\frac{1}{2}$ and add 5 to the product, we obtain 6. What is the number?

2. If $\frac{1}{3}$ is subtracted from a number and the difference is multiplied by 5, the result is twice the given number. What is the number?

3. The ratio of two numbers is 7 : 5. If their difference is 42, find the numbers.

4. Find two consecutive even numbers such that smaller of the two numbers is $\frac{4}{5}$ times the larger number.

5. The sum of three consecutive multiples of 7 is 777. Find these multiples.

6. The length of a rectangle is four times its breadth and the perimeter of the rectangle is 90 m. Find the dimensions of the rectangle.

7. The length of a rectangular park is 2 m less than thrice its breadth. The perimeter of the park is 156 m. Find the length and breadth of the park.

8. Present ages of Veena and Simi are in the ratio 2 : 5. Four years from now the ratio of their ages will be 1 : 2. Find their present ages.

9. 15 years from now Renu will be four times her present age. What is Renu's present age?

10. The sum of the digits of a two digit number is 7. The number obtained by interchanging the digits exceeds the original number by 27. Find the number.

11. The digit at the ten's place of a two-digit number is four times the digit at one's place. If the sum of this number and the number formed by reversing the digits is 55, find the numbers.

12. Numerator and denominator of a fraction are in the ratio of 3 : 5. If 4 is subtracted from the numerator, it reduces to $\frac{1}{5}$. Find the fraction.

13. Numerator of a fraction is 2 less than the denominator. If 1 is added to the numerator and 3 to the denominator then the fraction becomes $\frac{2}{3}$. Find the original fraction.

14. Meena has ₹ 600 in the form of notes of ₹ 10 and ₹ 20 denomination. Number of ₹ 10 notes is three times the number of ₹ 20 notes. Find the number of notes of each denomination.

15. A cashier in a bank counts the total money as ₹ 4,50,000 in the denomination of ₹ 1000, ₹ 500 and ₹ 100 notes. The number of notes are in the ratio 1 : 2 : 5. Find the number of notes of each denomination.

16. A group of people were asked to choose their favourite sport. One-forth chose basketball, one-third chose football and two-fifth chose cricket while 3 persons chose tennis. How many people were there in the group?

17. The sum of two numbers is 3000. If 8% of one number is equal to 12% of the other, find the numbers.

Sharpen Your Mind

I. Multiple Choice Questions

Choose the correct alternative :

1. Solution of the equation $\dfrac{-2}{3} = x + 2$ is _____

   (a) $x = \dfrac{-8}{3}$ (b) $x = \dfrac{8}{3}$ (c) $x = \dfrac{-3}{4}$ (d) $x = \dfrac{3}{4}$

2. Sum of two consecutive numbers is 87. The numbers are _____

   (a) 42, 45   (b) 43, 44   (c) 41, 46   (d) 40, 47

3. Three angles of a triangle are in the ratio 1 : 2 : 3. The largest angle is of the measure _____

   (a) 30°   (b) 60°   (c) 90°   (d) 108°

4. In a class of 30 students, number of boys is twice the number of girls, then the number of girls is _____

   (a) 9   (b) 10   (c) 11   (d) 12

5. Ages of A and B are in the ratio 3 : 4. Six years from now, their ages would be in the ratio 5 : 6. The ages of A and B now are _____

   (a) 6 years, 8 years   (b) 9 years, 12 years   (c) 12 years, 15 years   (d) 15 years, 18 years.

6. The solution of the equation $\dfrac{x+2}{3x+5} = -2$ is

   (a) $x = \dfrac{12}{7}$ (b) $x = \dfrac{-12}{7}$ (c) $x = \dfrac{5}{7}$ (d) $x = \dfrac{-5}{7}$

7. 21 years from now, I will be 4 times as old as my present age. My present age is _____ years.

   (a) 6   (b) 7   (c) 8   (d) none.

8. Four angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. The smallest angle is of the measure _____

   (a) 100°   (b) 80°   (c) 60°   (d) none.

9. 5 years ago, I was 16 years old. My age 8 years from now will be _____ years.

   (a) 22   (b) 23   (c) 28   (d) none.

10. A number multiplied by $\dfrac{3}{2}$ and then decreased by $\dfrac{3}{4}$ gives $\dfrac{5}{4}$. The number is _____.

   (a) $\dfrac{3}{2}$ (b) $\dfrac{4}{3}$ (c) $\dfrac{-3}{2}$ (d) $\dfrac{-4}{3}$

II. Fill up the Blanks :

1. The sum of two consecutive odd numbers is 84, the numbers are _____ and _____ .

2. A number multiplied by 6 and then reduced by 3 gives 69, the number is _____ .

3. Twenty six years from now, Rajesh will be thrice his present age. His present age is _____ .

4. The number of boys is $\dfrac{3}{2}$ the number of girls in a class. The total strength is 40. The number of girls is _____ .

5. The sum of three consecutive multiples of 4 is 204. The multiples are _____ , _____ and _____ .

III. True or False

1. $x = \dfrac{-2}{19}$ is a solution of the equation $\dfrac{2x-9}{3x-4} = \dfrac{-5}{2}$ ☐

2. A number multiplied by 5 and then increased by 9 gives 44. The number is 7 ☐

3. The difference between the number and its one-fifth is 16. The number is 24 ☐

4. The sum of two consecutive multiples of 7 is 168. The multiples are 77, 84 ☐

5. The perimeter of a rectangle is 90 m whose breadth is 10 m less than its length. We can write the equation as $2(x - 10) = 90$ ☐

IV. Match the Following :

Column A	Column B
(a) $\dfrac{x-3}{2} = x + 1$	(i) $x = \dfrac{13}{3}$
(b) $2(x + 3) - 5(x - 2) = 3$	(ii) $x = \dfrac{4}{17}$
(c) $\dfrac{5(2x+1)}{3(2x-1)} = \dfrac{-4}{3}$	(iii) $x = -5$
(d) $\dfrac{7x+2}{2} = \dfrac{2x+5}{3}$	(iv) $x = 2$
(e) $3(2x + 5) - 2(4x + 3) = 5$	(v) $x = -\dfrac{1}{18}$

Chapter Assessment

SECTION A : Short Answer Questions (2 marks)

1. Is $x = -2$ a solution of the equation $2(x - 3) = 5x + 2$?
2. Solve the equation : $15x - 6 = 1.5$
3. Find the number which is greater than one-fifth of itself by 12.
4. The area of a rectangle is 54 m², whose length is 3 m more than its width. Find the dimensions of the rectangle.
5. Find the value of x : $0.3x + 0.5 = 0.4x - 0.2$

SECTION B : Short Answer Questions (3 marks)

4 × 3 = 12 marks

1. Solve the equation : $\dfrac{2y - 15}{1 - 3y} = \dfrac{-29}{22}$
2. Solve the equation : $\dfrac{2x - 1}{3} - \dfrac{6x - 2}{5} = \dfrac{1}{3}$
3. The ratio of Meera's age to Ritu's age is 6 : 7. After 12 years, the ratio of their ages will be 12 : 13. Find their present age.
4. The denominator of a rational number is greater than its numerator by 7. If the numerator is increased by 19 and the denominator is decreased by 3, the new number becomes 4. Find the original number.

SECTION C : Long Answer Questions (4 marks)

2 × 4 = 8 marks

1. A group of people were asked to choose their favourite fruit. One-fourth chose apples, one-third chose mango, two-fifth chose grapes and five people choose plums. How many people are there in the group?
2. The sum of the digits of a two-digit number is 9. The number formed by reversing the digits is 45 more than the original number. Find the original number.