

19

$$\frac{x}{12-x} = \frac{10}{30}$$

20

$$2x:m = 4r:s$$

3. The numerator of a fraction is 8 less than the denominator of the fraction. The value of fraction is  $\frac{3}{5}$ . Find the fraction.
4. The denominator of a fraction exceeds twice the numerator of the fraction by 10. The value of the fraction is  $\frac{5}{12}$ . Find the fraction.
5. The denominator of a fraction is 30 more than the numerator of the fraction. If 10 is added to the numerator of the fraction and the denominator is unchanged, the value of the resulting fraction becomes  $\frac{3}{5}$ . Find the original fraction.
6. The numerator of a certain fraction is 3 times the denominator. If the numerator is decreased by 1 and the denominator is increased by 2, the value of the resulting fraction is  $\frac{5}{2}$ . Find the original fraction.
7. What number must be added to both numerator and denominator of the fraction  $\frac{7}{19}$  to make the resulting fraction equal to  $\frac{3}{4}$ ?
8. The numerator of the fraction exceeds the denominator by 3. If 3 is added to the numerator and 3 is subtracted from the denominator, the resulting fraction is equal to the  $\frac{5}{2}$ . Find the original fraction.
9. The numerator of a fraction is 7 less than the denominator. If 3 is added to the numerator and 9 is subtracted from the denominator, the new fraction is equal to  $\frac{3}{2}$ . Find the original fraction.
10. Johnson was usually the best free throw shooter on his basketball team. Early in the season, however, he had made only 9 of 20 shots. By the end of season, he had made all the additional shots he had taken, thereby ending with a season record of 3:4. How many additional shots had he taken.
11. What is the fourth proportion of 1, 3 and 4.





## Question 3:

- 1 Let the denominator be  $x$ .
- 2 The numerator is  $x - 8$ .
- 3 The fraction is  $\frac{x - 8}{x}$ .
- 4 We are given that  $\frac{x - 8}{x} = \frac{3}{5}$ .
- 5 Cross-multiplying, we get  
 $5(x - 8) = 3x$ .
- 6 Expanding, we get  $5x - 40 = 3x$ .
- 7 Solving for  $x$ , we get  $2x = 40$ .
- 8 Therefore,  $x = 20$ .
- 9 The numerator is  
 $x - 8 = 20 - 8 = 12$ .

Answer: The fraction is  $\frac{12}{20}$ .



## Question 4:

- 1 Let the numerator be  $x$ .
- 2 The denominator is  $2x + 10$ .
- 3 The fraction is  $\frac{x}{2x + 10}$ .
- 4 We are given that  $\frac{x}{2x + 10} = \frac{5}{12}$ .
- 5 Cross-multiplying, we get
$$12x = 5(2x + 10).$$
- 6 Expanding, we get  $12x = 10x + 50$ .
- 7 Solving for  $x$ , we get  $2x = 50$ .
- 8 Therefore,  $x = 25$ .
- 9 The denominator is
$$2x + 10 = 2(25) + 10 = 60.$$

Answer: The fraction is  $\frac{25}{60}$ .

## Question 5:



## Question 5:

- 1 Let the numerator be  $x$ .
- 2 The denominator is  $x + 30$ .
- 3 The original fraction is  $\frac{x}{x + 30}$ .
- 4 After adding 10 to the numerator,  
the fraction becomes  $\frac{x + 10}{x + 30}$ .
- 5 We are given that  $\frac{x + 10}{x + 30} = \frac{3}{5}$ .
- 6 Cross-multiplying, we get  
 $5(x + 10) = 3(x + 30)$ .
- 7 Expanding, we get  
 $5x + 50 = 3x + 90$ .
- 8 Solving for  $x$ , we get  $2x = 40$ .
- 9 Therefore,  $x = 20$ .
- 10 The denominator is  
 $x + 30 = 20 + 30 = 50$ .



Answer: The original fraction is  $\frac{20}{50}$ .

## Question 6:

- 1 Let the denominator be  $x$ .
- 2 The numerator is  $3x$ .
- 3 The original fraction is  $\frac{3x}{x}$ .
- 4 After decreasing the numerator by 1 and increasing the denominator by 2, the fraction becomes  $\frac{3x - 1}{x + 2}$ .
- 5 We are given that  $\frac{3x - 1}{x + 2} = \frac{5}{2}$ .
- 6 Cross-multiplying, we get  $2(3x - 1) = 5(x + 2)$ .
- 7 Expanding, we get  $6x - 2 = 5x + 10$ .
- 8 Solving for  $x$ , we get  $x = 12$ .
- 9 The numerator is  $3x = 3(12) = 36$ .



$$6x - 2 = 5x + 10 .$$

- 8 Solving for  $x$  , we get  $x = 12$  .
- 9 The numerator is  $3x = 3(12) = 36$  .

Answer: The original fraction is  $\frac{36}{12}$  .

## Question 7:

- 1 Let the number to be added be  $x$  .
- 2 The new fraction is  $\frac{7 + x}{19 + x}$  .
- 3 We are given that  $\frac{7 + x}{19 + x} = \frac{3}{4}$  .
- 4 Cross-multiplying, we get
$$4(7 + x) = 3(19 + x) .$$
- 5 Expanding, we get
$$28 + 4x = 57 + 3x .$$
- 6 Solving for  $x$  , we get  $x = 29$  .

Answer: The number to be added is 29.



## Question 8:

- 1 Let the denominator be  $x$ .
- 2 The numerator is  $x + 3$ .
- 3 The original fraction is  $\frac{x + 3}{x}$ .
- 4 After adding 3 to the numerator and subtracting 3 from the denominator, the fraction becomes  $\frac{x + 6}{x - 3}$ .
- 5 We are given that  $\frac{x + 6}{x - 3} = \frac{5}{2}$ .
- 6 Cross-multiplying, we get  $2(x + 6) = 5(x - 3)$ .
- 7 Expanding, we get  $2x + 12 = 5x - 15$ .
- 8 Solving for  $x$ , we get  $3x = 27$ .
- 9 Therefore,  $x = 9$ .
- 10 The numerator is





- 10 The numerator is

$$x + 3 = 9 + 3 = 12 .$$

Answer: The original fraction is  $\frac{12}{9}$  .

## Question 9:

- 1 Let the denominator be  $x$  .

- 2 The numerator is  $x - 7$  .

- 3 The original fraction is  $\frac{x - 7}{x}$  .

- 4 After adding 3 to the numerator and subtracting 9 from the denominator, the fraction

becomes  $\frac{x - 4}{x - 9}$  .

- 5 We are given that  $\frac{x - 4}{x - 9} = \frac{3}{2}$  .

- 6 Cross-multiplying, we get

$$2(x - 4) = 3(x - 9) .$$

- 7 Expanding, we get

$$2x - 8 = 3x - 27 .$$





- 1 Let the denominator be  $x$ .
- 2 The numerator is  $x - 7$ .
- 3 The original fraction is  $\frac{x - 7}{x}$ .
- 4 After adding 3 to the numerator and subtracting 9 from the denominator, the fraction becomes  $\frac{x - 4}{x - 9}$ .
- 5 We are given that  $\frac{x - 4}{x - 9} = \frac{3}{2}$ .
- 6 Cross-multiplying, we get  $2(x - 4) = 3(x - 9)$ .
- 7 Expanding, we get  $2x - 8 = 3x - 27$ .
- 8 Solving for  $x$ , we get  $x = 19$ .
- 9 The numerator is  $x - 7 = 19 - 7 = 12$ .

Answer: The original fraction is  $\frac{12}{19}$ .

**10.**

- 1 Let  $x$  be the additional shots. He made  $9 + x$  shots out of  $20 + x$  shots.
- 2  $(9 + x)/(20 + x) = 3/4$
- 3 Cross-multiply:  $4(9 + x) = 3(20 + x)$
- 4  $36 + 4x = 60 + 3x$
- 5  $x = 24$

Answer: He took 24 additional shots.

**11.**

- 1 Let the fourth proportion be  $x$ . The proportion is  $1:3::4:x$
- 2  $1/3 = 4/x$
- 3 Cross-multiply:  $x = 12$

Answer: The fourth proportion is 12.