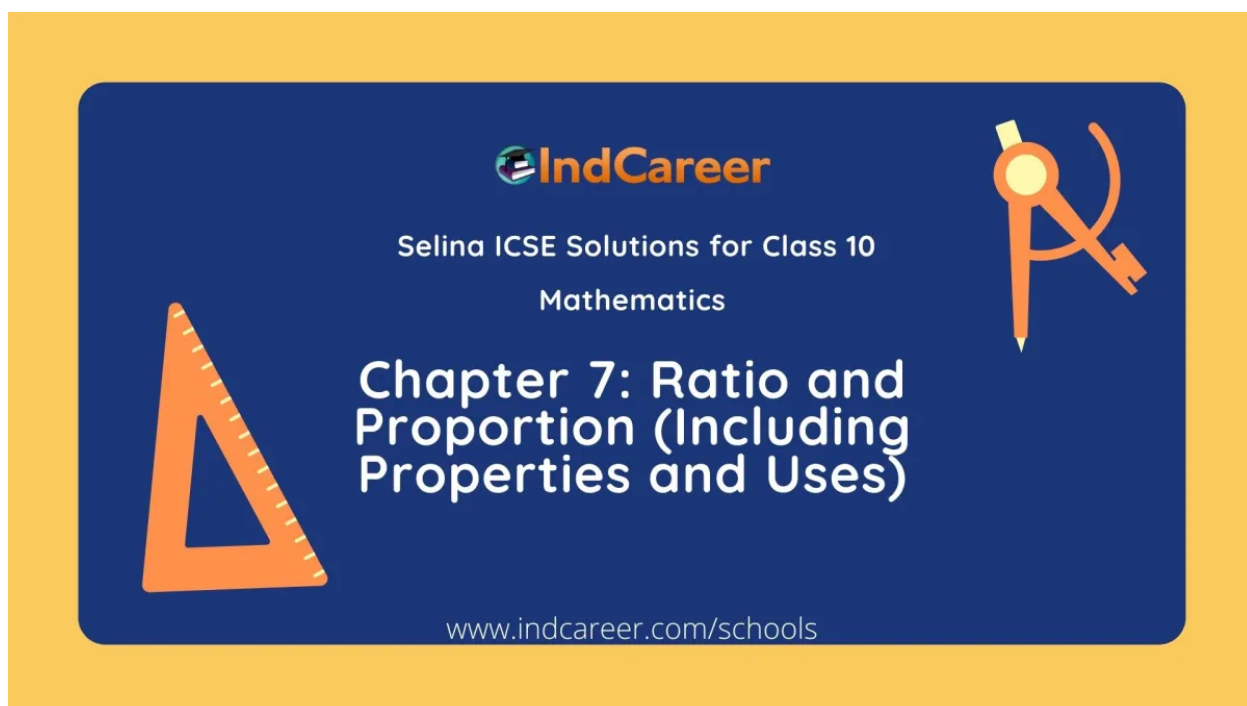


Selina Class 10 ICSE Solutions Mathematics :

Chapter 7 - Ratio and Proportion (Including Properties and Uses)



For any clarifications or questions you can write to **info@indcareer.com**

Postal Address

IndCareer.com, 52, Shilpa Nagar, Somalwada Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888, **Website:** <https://www.indcareer.com>

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>



Selina Class 10 ICSE Solutions Mathematics :

Chapter 7 - Ratio and Proportion (Including Properties and Uses)

Class 10: Maths Chapter 7 solutions. Complete Class 10 Maths Chapter 7 Notes.

Selina Class 10 ICSE Solutions Mathematics : Chapter 7 - Ratio and Proportion (Including Properties and Uses)

Selina 10th Maths Chapter 7, Class 10 Maths Chapter 7 solutions

Exercise 7A

Question 1.

If $a : b = 5 : 3$, find: $\frac{5a - 3b}{5a + 3b}$.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$a : b = 5 : 3$$

$$\Rightarrow \frac{a}{b} = \frac{5}{3}$$

$$\frac{5a - 3b}{5a + 3b} = \frac{5\left(\frac{a}{b}\right) - 3}{5\left(\frac{a}{b}\right) + 3} \quad (\text{Dividing each term by } b)$$

$$= \frac{5\left(\frac{5}{3}\right) - 3}{5\left(\frac{5}{3}\right) + 3}$$

$$= \frac{\frac{25}{3} - 3}{\frac{25}{3} + 3}$$

$$= \frac{25 - 9}{25 + 9}$$

$$= \frac{16}{34} = \frac{8}{17}$$

Question 2.

If $x : y = 4 : 7$, find the value of $(3x + 2y) : (5x + y)$.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$x : y = 4 : 7$$

$$\Rightarrow \frac{x}{y} = \frac{4}{7}$$

$$\frac{3x + 2y}{5x + y} = \frac{3\left(\frac{x}{y}\right) + 2}{5\left(\frac{x}{y}\right) + 1} \quad \text{(Dividing each term by } y \text{)}$$

$$= \frac{3\left(\frac{4}{7}\right) + 2}{5\left(\frac{4}{7}\right) + 1}$$

$$= \frac{\frac{12}{7} + 2}{\frac{20}{7} + 1}$$

$$= \frac{12 + 14}{20 + 7}$$

$$= \frac{26}{27}$$

Question 3.

If $a : b = 3 : 8$, find the value of $\frac{4a + 3b}{6a - b}$.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$a : b = 3 : 8$$

$$\Rightarrow \frac{a}{b} = \frac{3}{8}$$

$$\frac{4a + 3b}{6a - b} = \frac{4\left(\frac{a}{b}\right) + 3}{6\left(\frac{a}{b}\right) - 1}$$

(Dividing each term by b)

$$= \frac{4\left(\frac{3}{8}\right) + 3}{6\left(\frac{3}{8}\right) - 1}$$

$$= \frac{\frac{3}{2} + 3}{\frac{9}{4} - 1}$$

$$= \frac{\frac{9}{2}}{\frac{5}{4}}$$

$$= \frac{18}{5}$$

Question 4.

If $(a - b) : (a + b) = 1 : 11$, find the ratio $(5a + 4b + 15) : (5a - 4b + 3)$.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$\frac{a-b}{a+b} = \frac{1}{11}$$

$$11a - 11b = a + b$$

$$10a = 12b$$

$$\frac{a}{b} = \frac{12}{10} = \frac{6}{5}$$

So, let $a = 6k$ and $b = 5k$

$$\begin{aligned}\frac{5a + 4b + 15}{5a - 4b + 3} &= \frac{5(6k) + 4(5k) + 15}{5(6k) - 4(5k) + 3} \\ &= \frac{30k + 20k + 15}{30k - 20k + 3} \\ &= \frac{50k + 15}{10k + 3} \\ &= \frac{5(10k + 3)}{10k + 3} \\ &= 5\end{aligned}$$

Hence, $(5a + 4b + 15) : (5a - 4b + 3) = 5 : 1$

Question 5.



Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

Let the required number be $\frac{x}{y}$.

$$\text{Now, Ratio of } \frac{8}{21} \text{ to } \frac{4}{9} = \frac{\frac{8}{21}}{\frac{4}{9}} = \frac{8}{21} \times \frac{9}{4} = \frac{6}{7}$$

Thus, we have

$$\frac{\frac{x}{y}}{\frac{7}{33}} = \frac{6}{7}$$

$$\Rightarrow \frac{x}{y} = \frac{6}{7} \times \frac{7}{33}$$

$$\Rightarrow \frac{x}{y} = \frac{6}{7} \times \frac{7}{33}$$

$$\Rightarrow \frac{x}{y} = \frac{2}{11}$$

Hence, the required number is $\frac{2}{11}$.

Question 6.

$$\text{If } \frac{m+n}{m+3n} = \frac{2}{3}, \text{ find : } \frac{2n^2}{3m^2 + mn}.$$

Solution:

$$\frac{m+n}{m+3n} = \frac{2}{3}$$

$$\Rightarrow 3m + 3n = 2m + 6n$$

$$\Rightarrow m = 3n$$

$$\Rightarrow \frac{m}{n} = \frac{3}{1}$$

$$\begin{aligned}\frac{2n^2}{3m^2 + mn} &= \frac{2}{3\left(\frac{m}{n}\right)^2 + \left(\frac{m}{n}\right)} \quad (\text{Dividing each term by } n^2) \\ &= \frac{2}{3\left(\frac{3}{1}\right)^2 + \left(\frac{3}{1}\right)} \\ &= \frac{2}{27 + 3} = \frac{1}{15}\end{aligned}$$

Question 7.

Find $\frac{x}{y}$, when $x^2 + 6y^2 = 5xy$.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$x^2 + 6y^2 = 5xy$$

Dividing both sides by y^2 , we get,

$$\frac{x^2}{y^2} + \frac{6y^2}{y^2} = \frac{5xy}{y^2}$$

$$\left(\frac{x}{y}\right)^2 + 6 = 5\left(\frac{x}{y}\right)$$

$$\left(\frac{x}{y}\right)^2 - 5\left(\frac{x}{y}\right) + 6 = 0$$

$$\text{Let } \frac{x}{y} = a$$

$$\therefore a^2 - 5a + 6 = 0$$

$$\Rightarrow (a - 2)(a - 3) = 0$$

$$\Rightarrow a = 2, 3$$

$$\text{Hence, } \frac{x}{y} = 2, 3$$

Question 8.

If the ratio between 8 and 11 is the same as the ratio of $2x - y$ to $x + 2y$, find the value of $\frac{7x}{9y}$.

Solution:

$$\frac{2x - y}{x + 2y} = \frac{8}{11}$$

$$22x - 11y = 8x + 16y$$

$$\text{Given, } 14x = 27y$$

$$\frac{x}{y} = \frac{27}{14}$$

$$\therefore \frac{7x}{9y} = \frac{7 \times 27}{9 \times 14} = \frac{3}{2}$$

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

Question 9.

Divide Rs 1,290 into A, B and C such that A is $\frac{2}{5}$ of B and $B : C = 4 : 3$.

Solution:

$$\text{Given, } B : C = 4 : 3 \Rightarrow \frac{B}{C} = \frac{4}{3}$$

$$\text{And, } A = \frac{2}{5}B \Rightarrow \frac{A}{B} = \frac{2}{5}$$

$$\text{Now, } \frac{A}{B} = \frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20} \text{ and } \frac{B}{C} = \frac{4 \times 5}{3 \times 5} = \frac{20}{15}$$

$$\Rightarrow A : B : C = 8 : 20 : 15$$

$$\Rightarrow A = 8x, B = 20x \text{ and } C = 15x$$

$$\therefore 8x + 20x + 15x = 1290$$

$$\Rightarrow 43x = 1290$$

$$\Rightarrow x = 30$$

$$\text{A's share} = 8x = 8 \times 30 = \text{Rs. } 240$$

$$\text{B's share} = 20x = 20 \times 30 = \text{Rs. } 600$$

$$\text{C's share} = 15x = 15 \times 30 = \text{Rs. } 450$$

Question 10.

A school has 630 students. The ratio of the number of boys to the number of girls is 3 : 2. This ratio changes to 7 : 5 after the admission of 90 new students. Find the number of newly admitted boys.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

**Question 11.**

What quantity must be subtracted from each term of the ratio 9: 17 to make it equal to 1: 3?

Solution:

Let x be subtracted from each term of the ratio 9: 17.

$$\begin{aligned}\frac{9-x}{17-x} &= \frac{1}{3} \\ 27 - 3x &= 17 - x \\ 10 &= 2x \\ x &= 5\end{aligned}$$

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

Thus, the required number which should be subtracted is 5.

Question 12.

The monthly pocket money of Ravi and Sanjeev are in the ratio 5 : 7. Their expenditures are in the ratio 3 : 5. If each saves Rs. 80 every month, find their monthly pocket money.

Solution:

Given that the pocket money of Ravi and Sanjeev are in the ratio 5 : 7

Thus, the pocket money of Ravi is $5k$ and that of Sanjeev is $7k$.

Also given that the expenditure of Ravi and Sanjeev are in the ratio 3 : 5

Thus, the expenditure of Ravi is $3m$ and that of Sanjeev is $5m$.

And each of them saves Rs. 80

$$\Rightarrow 5k - 3m = 80 \dots (1)$$

$$7k - 5m = 80 \dots (2)$$

Solving equations (1) and (2), we have,

$$k = 40, m = 40$$

Hence the monthly pocket money of Ravi is Rs. 200 and that of Sanjeev is Rs. 280.

Question 13.

The work done by $(x - 2)$ men in $(4x + 1)$ days and the work done by $(4x + 1)$ men in $(2x - 3)$ days are in the ratio 3: 8. Find the value of x .

Solution:

Assuming that all the men do the same amount of work in one day and one day work of each man = 1 units, we have,

Amount of work done by $(x - 2)$ men in $(4x + 1)$ days

= Amount of work done by $(x - 2)(4x + 1)$ men in one day

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

$$= (x - 2)(4x + 1) \text{ units of work}$$

Similarly,

Amount of work done by $(4x + 1)$ men in $(2x - 3)$ days

$$= (4x + 1)(2x - 3) \text{ units of work}$$

According to the given information,

$$\frac{(x - 2)(4x + 1)}{(4x + 1)(2x - 3)} = \frac{3}{8}$$

$$\frac{x - 2}{2x - 3} = \frac{3}{8}$$

$$8x - 16 = 6x - 9$$

$$2x = 7$$

$$x = \frac{7}{2} = 3.5$$

Question 14.

The bus fare between two cities is increased in the ratio 7: 9. Find the increase in the fare, if:

- (i) the original fare is Rs 245;
- (ii) the increased fare is Rs 207.

Solution:

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

According to the given information,

$$\text{Increased (new) bus fare} = \frac{9}{7} \times \text{original bus fare}$$

(i) We have:

$$\text{Increased (new) bus fare} = \frac{9}{7} \times \text{Rs } 245 = \text{Rs } 315$$

$$\therefore \text{Increase in fare} = \text{Rs } 315 - \text{Rs } 245 = \text{Rs } 70$$

(ii) We have:

$$\text{Rs } 207 = \frac{9}{7} \times \text{original bus fare}$$

$$\text{Original bus fare} = \text{Rs } 207 \times \frac{7}{9} = \text{Rs } 161$$

$$\therefore \text{Increase in fare} = \text{Rs } 207 - \text{Rs } 161 = \text{Rs } 46$$



Selina Publishers ICSE Solutions

Class 10 Maths

- [Chapter 1 - GST \(Goods and Services Tax\)](#)
- [Chapter 2 - Banking \(Recurring Deposit Accounts\)](#)
- [Chapter 3 - Shares and Dividends](#)
- [Chapter 4 - Linear Inequations \(in one variable\)](#)
- [Chapter 5 - Quadratic Equations](#)
- [Chapter 6 - Solving Simple Problems \(Based on Quadratic Equations\)](#)
- [Chapter 7 - Ratio and Proportion \(Including Properties and Uses\)](#)
- [Chapter 8 - Remainder and Factor Theorems](#)
- [Chapter 9 - Matrices](#)
- [Chapter 10- Arithmetic Progression](#)
- [Chapter 11- Geometric Progression](#)
- [Chapter 12- Reflection](#)
- [Chapter 13 - Section and Mid-Point Formula](#)
- [Chapter 14- Equation of a Line](#)
- [Chapter 15- Similarity](#)
- [Chapter 16- Loci \(Locus and Its Constructions\)](#)
- [Chapter 17- Circles](#)
- [Chapter 18- Tangents and Intersecting Chords](#)
- [Chapter 19- Constructions \(Circles\)](#)
- [Chapter 20- Cylinder, Cone and Sphere](#)
- [Chapter 21- Trigonometrical Identities](#)
- [Chapter 22- Heights and Distances](#)
- [Chapter 23- Graphical Representation](#)
- [Chapter 24- Measures of Central Tendency](#)
- [Chapter 25- Probability](#)

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

About About Selina Publishers ICSE

Selina Publishers has been serving the students since 1976 and is one of the quality ICSE school textbooks publication houses. Mathematics and Science books for classes 6-10 form the core of our business, apart from certain English and Hindi literature as well as a few primary books. All these books are based upon the syllabus published by the Council for the I.C.S.E. Examinations, New Delhi. The textbooks are composed by a panel of subject experts and vetted by teachers practising in ICSE schools all over the country. Continuous efforts are made in complying with the standards and ensuring lucidity and clarity in content, which makes them stand tall in the industry.

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>

About IndCareer

IndCareer.com is a leading developer of online career guidance resources for the Indian marketplace. Established in 2007, IndCareer.com is currently used by over thousands of institutions across India, including schools, employment agencies, libraries, colleges and universities.

IndCareer.com is designed to assist you in making the right career decision - a decision that meets your unique interests and personality.

For any clarifications or questions you can write to **info@indcareer.com**

Postal Address

IndCareer.com
52, Shilpa Nagar,
Somalwada
Nagpur - 440015
Maharashtra, India

WhatsApp: +91 9561 204 888

Website: <https://www.indcareer.com>

<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-7-ratio-and-proportion-including-properties-and-uses/>