ICSE Class 8 Maths Selina Solutions Chapter 10: These kinds of situations, where a change in one quantity causes a change in another, are common in real life. For instance, if an automobile's speed is raised, it will take less time to travel the same distance. Let's use one more example: to expedite the completion of a building project, we must assign additional labor.

Therefore, the less time it takes to finish the work, the more workers there are. You must have realized by now that there is a relationship between them because variations in one quantity cause variations in other quantities. All of these ideas are covered in ICSE Class 8 Maths Chapter 10.

For the convenience of the students, we have included a thorough solution for ICSE Class 8 Maths Selina Solutions Chapter 10 Direct and Inverse Variations in PDF format. The simplest versions of these Selina Solutions have been produced by seasoned educators. Students can quickly understand how the questions are answered by going through them. These solutions will also assist pupils in getting ready for their yearly exams. To obtain the Solution PDF, click the provided link.

ICSE Class 8 Maths Selina Solutions Chapter 10 Overview

Chapter 10 of Selina Solutions for ICSE Class 8 Maths focuses on Direct and Inverse Variations. In this chapter, students learn about the relationships between quantities that either vary directly or inversely with each other.

Direct variation occurs when one quantity increases (or decreases) in proportion to another. The concept is explored through examples where the relationship can be expressed as y=kx, where k is a constant of proportionality.

Inverse variation, on the other hand, describes situations where one quantity increases as another decreases, and vice versa, while their product remains constant. This relationship is typically represented, where k is again a constant.

ICSE Class 8 Maths Selina Solutions Chapter 10

Here we have provided ICSE Class 8 Maths Selina Solutions Chapter 10 for the ease of students so that they can prepare better for their upcoming exams -

In which of the following tables, x, and y vary directly:

(i)

x	3	5	8	11

| y | 4.5 | 7.5 | 12 | 16.5 |

Solution:-

$$\frac{x_1}{y_1} = \frac{3}{4.5} = \frac{1}{1.5}$$
$$\frac{x_2}{y_2} = \frac{5}{7.5} = \frac{1}{1.5}$$
$$\frac{x_3}{y_3} = \frac{8}{12} = \frac{1}{1.5}$$

(Forming the given data in fractional form)

$$\frac{x_4}{y_4} = \frac{11}{16.5} = \frac{1}{1.5}$$
$$\Rightarrow \frac{x_1}{y_1} = \frac{x_2}{y_2} = \frac{x_3}{y_3} = \frac{x_4}{y_4}$$

Yes, x and y vary directly.

(ii)

| x | 16 | 30 | 40 | 56 |
| y | 32 | 60 | 80 | 84 |

Solution:-

$$\frac{x_1}{y_1} = \frac{16}{32} = \frac{1}{2}$$

(Forming the given data in fractional form)

$$\frac{x_2}{y_2} = \frac{30}{60} = \frac{1}{2}$$
$$\frac{x_3}{y_3} = \frac{40}{80} = \frac{1}{2}$$
$$\frac{x_4}{y_4} = \frac{56}{84} = \frac{28}{42} = \frac{14}{21} = \frac{7}{3}$$
$$\Rightarrow \frac{x_1}{y_1} = \frac{x_2}{y_2} = \frac{x_3}{y_3} \neq \frac{x_4}{y_4}$$

x and y are not in direct variation.

(iii)

| x | 27 | 45 | 54 | 75 |
| y | 81 | 180 | 216 | 225 |

Solution:-

$$\frac{x_1}{y_1} = \frac{27}{81} = \frac{3}{9} = \frac{1}{3}$$

(Forming the given data in fractional form)

$$\frac{x_2}{y_2} = \frac{45}{150} = \frac{15}{50} = \frac{3}{10}$$
$$\frac{x_3}{y_3} = \frac{54}{216} = \frac{18}{72} = \frac{1}{4}$$
$$\frac{x_4}{y_4} = \frac{75}{225} = \frac{25}{45} = \frac{5}{9}$$
$$\Rightarrow \frac{x_1}{y_1} \neq \frac{x_2}{y_2} \neq \frac{x_3}{y_3} \neq \frac{x_4}{y_4}$$

x and y are not in direct variation.

Question 2.

If x and y vary directly, find the values of x,y , and z.

X	3	x	y	10
Y	36	60	96	Z

Solution:-

X and y are in direct variation

$$\therefore \frac{3}{36} = \frac{x}{60} = \frac{y}{96} = \frac{10}{z}$$

(Forming the given data in fractional form)

$$\Rightarrow \frac{3}{36} = \frac{x}{60}, \frac{3}{36} = \frac{y}{96}, \frac{3}{36} = \frac{10}{z}$$
$$x = \frac{3}{36} \times 60, y = \frac{3}{36} \times 96$$
$$x = \frac{3}{36} \times 60, y = \frac{3}{36} \times 96$$
$$z = 10 \times \frac{36}{3}$$
$$\Rightarrow x=5, y=8, z=120$$

X	3	5	8	10
Y	36	60	96	120

A truck consumes 28 liters of diesel to move through a distance of 448km. How much distance will it cover in 64 liters of diesel?

Solution:-

Let the truck cover x km in 64 liters of diesel.

Diesel (in liters)	28	64
Distance (in km)	448	x

It is the case of direct variation

(Forming the given data in fractional form)

$$\Rightarrow \quad \frac{x_1}{y_1} = \frac{x_2}{y_2} \Rightarrow \frac{28}{448} = \frac{64}{x}$$

i.e., 28x=64 x 448

$$x = \frac{64 \times 448}{28} = 1024 \text{km}$$

Question 4.

For 100km, a taxi charges ₹ 1,800. How much will it charge for a journey of 120 km?

Solution:-

Let a charge of the car is ₹ x in 120km

Distance in (km)	1800	x
Taxi charges (₹)	100	120

$$\Rightarrow \frac{x_1}{y_1} = \frac{x_2}{y_2} \Rightarrow \frac{1800}{100} \times \frac{x}{120}$$
$$\Rightarrow 100x = 1800 \times 120$$
$$x = \frac{1800 \times 120}{100} = 2160 km$$

Question 5.

If 27 identical articles cost ₹ 1,890, how many articles can be bought for ₹ 1,750?

Solution:-

Let x number of articles be purchased in ₹ 1750

Cost (₹)	1890	1750

No. of articles | 27 | X

Since it is a case of direct variation

$$\Rightarrow \frac{1890}{27} = \frac{1750}{x}$$
$$\Rightarrow x = \frac{1750 \times 27}{1890}$$
$$= 25 \text{ articles}$$

Question 6.

7kg of rice costs Rs.1,120. How much rice can be bought for Rs.3,680?

Solution:

Rice: Cost : Rice: Cost

7kg: 1120 :: x kg : 3680

Question 7.

6 notebooks cost ₹ 156, find the cost of 54 such note-books.

Solution:-

Notebooks: cost:: notebooks: cost

$$6 : Rs.156 :: 54 : Rs.x$$

$$\therefore x = \frac{156 \times 54}{6} = Rs.1404$$

Question 8.

22 men can dig a 27 m-long trench in one day. How many men should be employed for digging a 135 m-long trench of the same type in one day?

Solution:-

Men: length trench:: men: length of trench

22 : 27m :: x : 135m (Expressing in ratios)

Question 9.

If the total weight of 11 identical articles is 77 kg, how many articles of the same type would weigh 224 kg?

Solution:-

No. of: weight :: no. of articles: weight

Articles

$$11 : 77 \text{ kg} :: x : 224 \text{kg}$$

$$x = \frac{11 \times 224}{77} = 32 \, articles$$

Question 10.

A train is moving at a uniform speed of 120km per hour.

(i) How far will it travel in 36 minutes?

Solution:-

Speed of train in 60 minutes =120 km

i.e. distance covered in 60 minutes

$$= \frac{120}{60}$$

Distance covered in 36 minutes

$$= \frac{120 \times 36}{60}$$
$$= 2 \times 36 = 73km$$

(ii) In how much time will it cover 210 km?

Solution:-

If distance covered is 120 km then time taken = 60 minutes

If distance covered is 1 km then time taken

$$= \frac{60}{120}$$

If distance covered is 210 km then time taken

$$= \frac{60}{120} \times 210 = 105$$
minutes

=1 hour 45 minutes

Question 1.

Check whether x and y vary inversely or not.

(i)

x	4	3	12	1
y	6	8	2	24

Solution:-

x and y are inversely proportional

Then xy are equal.

(i)

$$xy = 4 \times 6 = 24$$

$$xy = 3 \times 8 = 24$$

$$xy = 12 \times 2 = 24$$
(Using the data's in the table)

$$xy = 1 \times 24 = 24$$
xy in each case is equal

x and y are inversely proportional

Question 2.

If x and y vary inversely, find the values of 1, m, and n:

(i)

x	4	8	2	32
y	4	l	m	n

Solution:-

∵ x and y are inversely proportional

∴xy is equal

Now,

$$xy = 4 \times 4 = 16$$

$$8 \times l = 16 \Rightarrow l = \frac{16}{8} = 2$$

$$2 \times m = 16 \Rightarrow m = \frac{16}{2} = 8$$

$$32 \times n = 16 \Rightarrow n = \frac{16}{32} = 0.5$$

(ii)

x	24	32	m	16
y	l	12	8	n

Solution:-

∵ x and y are inversely proportional

∴ xy is equal

Now,

$$xy = 32 \times 12 = 384$$

$$24 \times l = 384 \Rightarrow l = \frac{384}{24} = 16$$

$$m \times 8 = 384 \Rightarrow m = \frac{384}{8} = 48$$

$$16 \times n = 384 \Rightarrow n = \frac{384}{16} = 24$$

Question 3.

36 men can do a piece of work in 7 days. How many men will do the same work in 42 days?

Solution:-

Men: Days :: Men: Days

36 : 7 : x : 42

∴ By inverse proportional

Question 4.

12 pipes, all of the same size, fill a tank in 42 minutes. How long will it take to fill the same tank, if 21 pipes of the same size are used?

Solution:-

Pipes : Time :: Pipes: Time

$12 : 2x :: 21 : 42$

∴ By inverse proportion

$12 \times 42 = 21 \times x$

$\Rightarrow x = \frac{12 \times 42}{21} = 24 minutes$

Question 5.

In a fort 150 men had provisions for 45 days. After 10 days, 25 men left the fort. How long would the food last at the same rate?

Solution:-

After 10 days: For 150 men, provision will last (45−10) days =35 days

For 1 man, the provisions will last

$= 150 \times 35 days$

And for (150−25)=125 men, the provisions will last for

$= \frac{150 \times 35}{125} = 42$

days.

Benefits of ICSE Class 8 Maths Selina Solutions Chapter 10

Studying Selina Solutions for ICSE Class 8 Maths Chapter 10 on direct and inverse proportions offers several benefits to students:

Concept Clarity: The chapter provides clear explanations and examples to help students understand the concepts of direct and inverse proportions. This clarity enables them to grasp how quantities relate to each other and how changes in one affect the other.

Problem-Solving Skills: By practicing problems related to direct and inverse variations, students develop strong problem-solving skills. They learn to apply mathematical formulas and methods to analyze and solve problems involving these types of relationships.

Real-World Applications: Understanding direct and inverse proportions helps students recognize these relationships in real-life situations. This practical knowledge can be applied to fields such as science, economics, engineering, and everyday decision-making.

Foundation for Advanced Topics: Mastery of direct and inverse proportions lays a solid foundation for more advanced topics in mathematics and science. It prepares students for higher-level studies where such proportional relationships are fundamental.

Logical Thinking: Working with direct and inverse proportions requires logical thinking and reasoning skills. Students learn to analyze problems, formulate strategies, and justify their solutions, which enhances their overall cognitive development.

Preparation for Exams: Since direct and inverse proportions are frequently tested in exams, studying this chapter thoroughly ensures that students are well-prepared to tackle related questions confidently.