EXERCISE

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			**80**	**84**

Solut

$\frac{x_1}{y_1}$ ata in fractiona form)

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

x and y .

(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)

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

$= \frac{3}{36} \times 60, y = \frac{3}{36} \times 96\ z = 10 \times \frac{36}{3}$

⇒x = 5, y = 8, z = 120

X	3	5	8	10
Y	36	60	96	120

Question

A truc **l for moving through a distan e of 448km. How muc distance will it cover**

Solu

Let **t** diesel.

Die		64
Distance (	448	x

It is the case of direct variation

(Forming the given data in fractional form)

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

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 charges of car is ₹ x in 120km

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

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

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 articles

Question 6.
7kg of rice ... much rice can be bought for Rs.3,680?
Solution
Rice :
7kg:
x = (

Que
6 not ... of 54 such note-books.
Soluti
Notebo
6 : Rs.156 :
x = (156 × 54)/6 = Rs. 1404

Question 8.
22 men can dig a 27m long trench in one day. How many men should be employed for digging 135m long trench of the same type in one day?
Solution:-
Men : length trench :: men : length of trench
22 : 27m :: x : 135m (Expressing in ratios)
x = (22 × 135)/27 = 110 men

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 kg :: x : 224kg
x = (11 × 224)/77 = 32 articles

Question 10.

A train is moving with 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 =120/60
Distance covered in 36 minutes = (120 × 36)/60 =2 × 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 = 60/120
If distance covered is 210 km then time taken = (60/120) × 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			**2**	**24**

Soluti
x and
Ther
(i)
xy=4
xy=3
xy=12
(Using
xy=1×24=2
xy in each case is
x and y are inversely proportional

(ii)

x	**30**	**120**	**60**	**24**
y	**60**	**30**	**30**	**75**

Solution:-
xy=30×60=1800
xy=120×30=3600
xy=60×30=1800
xy=24×75=1800
xy in each case is not equal.
x and y are not 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 × 4 =16
8 × l = 16 ⇒ l = 16/8 = 2
2 × m = 16 ⇒ m = 16/2 = 8
32 × n = 16 ⇒ n = 16/32 =0.5

(ii)

x	**24**	**32**	**m**	**16**
y			**8**	**n**

Solu
∵x a
∴xy
Now,
(ii)
xy = 32 ×
24 × l = 384 16
m × 8 = 384 ⇒ m = 384/8 = 48
16 × n = 384 ⇒ n = 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
36 × 7 = x × 42 ⇒ x = (36×7)/42 = 6 men

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

$12 \times 42 = 21 \times x \Rightarrow x = (12 \times 42)/21 = 24$ 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 × 35 days
And for (150-25)=125 men, the provisions will last for = (150 × 35)/125 = 42 days.