NCERT SOLUTIONS OF Direct Proportion Exercise 2

Question 1

Which of the following are in inverse proportion?

(i) The number of workers on a job and the time to complete the job.

(ii) The time taken for a journey and the distance travelled in a uniform speed.

(iii) Area of cultivated land and the crop harvested.

(iv) The time taken for a fixed journey and the speed of the vehicle.

(v) The population of a country and the area of land per person.

Answer:

Two quantities are said to be in inverse proportion, if on increasing/decreasing one quantity, the other quantities decrease/increase such that product of the two quantities remain same

i) Here more the number of workers for the job, less time will be taken to complete the job, So inverse proportion
ii) Here more the distance to be travelled , more time will be taken at constant speed, so direct proportion
iii) Here more the area, more the crop harvested, so direct proportion
iv) Here more the speed, less time taken for fixed journey, so inverse proportion
v) Again same inverse proportion

Question 2

In a Television game show, the prize money of Rs 1,00,000 is to be divided equally amongst the winners. Complete the following table and find whether the prize money given to an individual winner is directly or inversely proportional to the number of winners?

Number of	1	2	4	5	8	10	20

winners							
Prize for each winner in Rs	1,00,000	50,000					

Answer:
Here more the winner, less will be the prize money for each winner, so number of winner and prize money are in inverse proportion

Also from the table
1×10,0000 =2×50,000= 100,000

Number of winners	1	2	4	5	8	10	20
Prize for each winner in Rs	1,00,000	50,000	a	b	c	d	e

Now

i) 4a=100,000

a=25,000

ii) 5b=100,000

b=20,000

iii) 8c=100,000
c=125,00
iv) 10d=100,000
d=10,000
v) 20e=100,000
e=50,00

So result table looks like

Number of winners	1	2	4	5	8	10	20
Prize for each winner in Rs	1,00,000	50,000	25,000	20,000	12,500	10,000	5,000

Question 3

Rehman is making a wheel using spokes. He wants to fix equal spokes in such a way that the angles between any pair of consecutive spokes are equal. Help him by completing the following table.

Number of spokes	4	6	8	10	12
Angle between two consecutive spoke	90^0	60^0			

(i) Are the number of spokes and the angles formed between the pairs of consecutive spokes in inverse proportion?

(ii) Calculate the angle between a pair of consecutive spokes on a wheel with 15 spokes.

(iii) How many spokes would be needed, if the angle between a pair of consecutive spokes is 40°?

Answer

In the given table, we see that

$4 \times 90 = 6 \times 60 = 360$

So number of spokes and angle between are in inverse proportion

Number of spokes	4	6	8	10	12
Angle between two consecutive spoke	90^0	60^0	a	b	c

$8a=360 \Rightarrow a=45^0$

$10b=360 \Rightarrow b=36^0$

$12c=360 \Rightarrow c=30^0$

Number of spokes	4	6	8	10	12
Angle between two consecutive spoke	90^0	60^0	45^0	36^0	30^0

i) As with increasing number of spokes the angle is decreasing so they are in inverse proportion.

ii) For 15 spokes
$15x=360 \Rightarrow x=24^0$

iii) Let y be the number of spokes required, then
$40y=360$
$y=9$

Question 4

If a box of sweets is divided among 24 children, they will get 5 sweets each. How many would each get, if the number of the children is reduced by 4?

Answer:

Here number of children and amount of sweets get is in inverse proportion as on increasing the children, the amount of sweet each children get is decreased

Let x be the amount of sweet if the number of children is 20

$20x = 24 \times 5$

$x = 6$

Question 5

A farmer has enough food to feed 20 animals in his cattle for 6 days. How long would the food last if there were 10 more animals in his cattle?

Answer

No of animals and days last are in inverse proportion as on increasing the animals, food will be consumed fast and it will finish in less number of days

Let x be the days for 30 animals

$30x = 120$

$x = 4$ days

Question 6

A contractor estimates that 3 persons could rewire Jasminder's house in 4 days. If, he uses 4 persons instead of three, how long should they take to complete the job?

Answer

Numbers of person and days to complete are in inverse proportion as on increasing the people, fewer days will be required

Let y be days required for 3 person

$3y = 12$

$x = 4$ days

Question 7

A batch of bottles were packed in 25 boxes with 12 bottles in each box. If the same batch is packed using 20 bottles in each box, how many boxes would be filled?

Answer

$20x=25\times 12$

$x=15$ boxes

Question 8

A factory requires 42 machines to produce a given number of articles in 63 days. How many machines would be required to produce the same number of articles in 54 days?

Answer

Let x be the machines

$42\times 63= 54x$

$x=49$ machines

Question 9

A car takes 2 hours to reach a destination by travelling at the speed of 60 km/h. How long will it take when the car travels at the speed of 80 km/h?

Answer

$2\times 60=80a$

$a=1.5$ hours

Question 10

Two persons could fit new windows in a house in 3 days.

(i) One of the persons fell ill before the work started. How long would the job take now?

(ii) How many persons would be needed to fit the windows in one day?

Answer:

i) $2 \times 3 = 1y$
$\Rightarrow y = 6$ days

ii) Using same calculation 6 persons are required to fit the windows in 1 day.

Question 11

A school has 8 periods a day each of 45 minutes duration. How long would each period be, if the school has 9 periods a day, assuming the number of school hours to be the same?

Answer

$8 \times 45 = 9a$

$a = 40$ minutes