MATHS

BOOKS - ICSE

DIRECT AND INVERSE VARIATIONS

Examples

1. Observe the table given below and find whether x and y are in direct variations or not

:

x	6	10	14	18	24
y	18	30	42	54	72

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2. From tha table given below find whether x and y in direct proporation or not.

x	30	20	24	16
y	36	30	30	20

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3. IF p and q are in direct variation of x, y and z

in the table given below:

p	6	x	y	30
q	72	60	96	z

4. If x and y vary directly find the missing

entries:

x	5	a	b	42
y	10	16	48	c

5. A car cover a distance of 216 km consuming 12 litres of petrol. How much distance will it cover consuming 18 litres of petrol ?

Petrol (in litres)	12	18
Distance (in km)	216	x

6. 15 m of cloth costs Rs. 1,940. find, how many metres of cloth of the same kind can be bought for Rs.4,656?

7. A journey of 240 km costs Rs. 4,080. how much distance will cost Rs.7,344?

Distance (in km)	240	x
Cost (in ₹)	4080	7344

8. A vertical pole,2 m 80 cm high, casts a shadow 1 m 60 cm long. Find, at the same time,

The length of shadow casted by a 5 m 25 cm high pole

9. A vertical pole 2 m 80 cm high, casts a shadow 1 m 60 cm long. Find, at the same time

The height of the pole which casts a shadow of length 2 m 50 cm.

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10. In which of the following tables x and y vary inversely.

x	2	4	8
y	32	16	8

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11. In which of the following tables x and y vary inversely.

x	2	4	8
y	32	16	8

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12. If p and q vary inversely, find the values of x,y and z.

p	8	2	y	10
q	2.5	x	5	z

13. If p and q vary inversely, find the values of x,y and z.

p	16	32	8	z
q	16	x	y	4

14. If 78 men can do a work in 140 days, in how many days will 42 men do the same work ?

15. A fort had provisions for 300 men for 90 days. After 20 days, 50 men left the fort. How long would the food last at the same rate?

16. A hostel had provisions for 75 students for 30 days. After 6 days, 15 more students joined the hostel. How long would the remaining

provisions last at the same rate for all the students ?

17. 8 men or 6 women earn Rs. 960 in one day.

One day's earning of a man.

18. 8 men or 6 women earn Rs. 960 in one day.

One day's earning of a woman.

19. 8 men or 6 women earn Rs. 960 in one day.

One day's earning of 4 men and 5 women.

20. 2 men or 3 women can do a piece of work in 45 days. Find, in how many days will 6 men and 1 woman be able to complete the same work ?

21. 3 men and 4 boys can complete a certain amount of work in 28 days, whereas 4 men and 6 boys can complete the same work in 20 days.

Find :

The number of days required by 7 men and 6 boys to complete the same work.

22. 3 men and 4 boys can complete a certain amount of work in 28 days, whereas 4 men and 6 boys can complete the same work in 20 days. Find :

The number of days required by 7 men and 6 boys to complete the same work.

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23. 30 men can build a wall in 50 days. How many more men are required to build another

wall, double in size, in 75 days?

24. A camp had sufficient food for 400 soldiers for 20 days. However, some soldiers left on the first day only and the the food lasted for 32 days. Find, how many soldiers had left ?

25. Eight men can dig a field 14 days,working 6 hours a day. In how many days can 7 men dig the same field, working 8 hours a day ?

26. 108 kg of ration is sufficient for 18 students for 15 days. Find, for how many students will 70 kg ration be sufficient for 25 days.

27. A contractor undertook to build a road in 200 days. He employed 140 men. After 60 days, he found that only one-fourth of the road could be built. How many additional men should he emp,oyed to complete the work in time ?

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28. A certain sum is divided equally among 50 boys and each boy gets 75. if the same sum is

divided equally among 60 boys, how much will each get ?

29. The cost of 15 pens is Rs.375. Find, how many pens can be bought for Rs. 800.

30. A can do a piece of work in 80 days and B in 100 days. They work together for first 20

days before B goes away. In how many days will A manage to finish the remaining work?

31. A and B can finish a piece of work in 12 days, B and C in 15 days shile C and A in 20 days. How long will they take to finish it together ? How long will each take to finish the work alone ?

32. A can do $\dfrac{1}{3}$ of a certain work in 12 days and B can do $\dfrac{1}{6}$ of the same work in 4 days. Find, in how many days will they together complete the work ?

33. A and B can do a piece of work in 45 days and 40 days respectively.They began the work together but A leaves after some days and B finishes the remaining work in 23 days. After how many days did A leave the work ?

34. An empty cistem can be filled by two pipes A and B in 12 minutes and 16 minutes respectively and the full cistem can be emptied by a third pipe C in 8 minnutes. If all the pipes be tumed on at the same time, in how much time will the empty cistern be full ?

Exercise 10 A

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

x	3	5	8	11
y	4.5	7.5	12	16.5

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

x	16	30	40	56
y	32	60	80	84

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

x	27	45	54	75
y	81	180	216	225

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

x	3	x	y	10
y	36	60	96	z

5. A truck consumes 28 litres of diesel for moving through a distance of 448 km. How much distance will it cover in 64 litres of diesel ?

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

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

8. 7 kg of rice costs Rs. 1,120. How much rice can be bought for Rs. 3,680 ?

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9. 6 note- books cost Rs. 156, find the cost of 54 such note-books.

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10. 22 men can dig a 27 m long trench in one day. How many men should be employed for digging 135 m long trench of the same type in one day ?

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

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12. A train is moving with uniform speed of 120 km per hour.

How far will it travel in 36 minutes ?

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13. A train is moving with uniform speed of 120 km per hour.

In how much time will it cover 210 km ?

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1. Check whether x and y vary inversely or not.

x	4	3	12	1
y	6	8	2	24

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2. Check whether x and y vary inversely or not.

x	30	120	60	24
y	60	30	30	75

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3. Check whether x and y vary inversely or not.

x	10	30	60	10
y	90	30	20	90

4. If x and y vary inversely, find the values of l, m and n :

x	4	8	2	32
y	4	l	m	n

5. If x and y vary inversely, find the values of l, m and n :

x	24	32	m	16
y	l	12	8	n

6. 36 men can do a piece of work in 7 days. How many men will do the same work in 42

days ?

7. 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 ?

8. 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 ?

9. 72 men do a piece of work in 25 days. In how

many days will 30 men do the same work ?

10. If 56 workers can build a wall in 180 hours,

how many workers will be required to do the

same work in 70 hours ?

11. A car take 6 hours to reach a distination by travelling at the speed of 50 km per hour. How long will it take when the car travels at the speed of 75 km per hour ?

Exercise 10 C

1. Cost of 24 identical articals Rs. 108. Find the cost of 40 similar articles.

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2. If 15 men can complete a piece of work in 30 days, in how many days will 18 men complete it ?

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3. In order to complete a work in 28 days, 60 men are required. How Mny men will be required if the same work is to be completed in 40 days ?

4. A fort had provisions for 450 soldiers for 40 days. After 10 days, 90 more soldiers come to the fort. Find for how many days will the remaining provisions last at the same rate ?

5. A garrison has sufficient provisions for 480 men for 12 days. If the number of men is reduced by 160, find how long will the provisions last ?

6. $\dfrac{3}{5}$ quital of wheat cost Rs. 210. find the cost of :

1 quintal of wheat

7. $\frac{3}{5}$ quital of wheat cost Rs. 210. find the cost

of :

0.4 quintal of wheat.

8. If $\frac{2}{9}$ of a property costs Rs. 2,52,00, find the

cost of $\frac{4}{7}$ of it.

9. 4 men or 6 women earn Rs. 360 in one days.

Find, how much will :

A man earn in one day ?

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10. 4 men or 6 women earn Rs. 360 in one days.

Find, how much will :

A woman earn in one day ?

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11. 4 men or 6 women earn Rs. 360 in one days. Find, how much will :

A man earn in one day ?

12. 16 boys went to a canteen to have tea and snacks together. The bill amounted to Rs.114.40. What will be the contribution of a boy who pays for himself and 5 others ?

13. 50 labourers can dig a point in 16 days. How many labourers will be reuired to dig another pond, double in size, in 20 days ?

14. If 12 men or 18 women can complete a piece of work in 7 days, in how many days can 4 men and 8 women complete the same work ?

15. If 3 men or 6 boys can finish a work in 20 days, how long will 4 men and 12 boys take to finish the same work ?

16. A particular work can be completed by 6 men and 6 women in 24 days, whereas the same work can be completed by 8 men and 12 women in 15 days. Find :

According to the amount of work done, one man is equivalent to how many women.

17. A particular work can be completed by 6 men and 6 women in 24 days, whereas the same work can be completed by 8 men and 12 women in 15 days. Find :

The time taken by 4 men and 6 women to complete the same work.

18. If 12 men and 16 boys can do a piece of work in 5 days and, 13 men and 24 boys can do it in 4 days, how long will 7 men and 10 boys take to do it ?

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Exercise 10 D

1. Eight oranges can be bought for Rs. 10.40. How many more can be bought for Rs. 16.90 ?

2. Fifteen men can build a wall in 60 days. How many more men are required to build another wall of same size in 45 days ?

3. Six taps can fill an empty cistern in 8 hours. How much more time will be taken, if two taps

go out of order ? Assume, all the taps supply water at the same rate.

4. A contractor undertook to dig a canal,6 kilometre long, in 35 days and employed 90 men. He finds that after 20 days only 2 km of canal have been dug. How many more men must he employ to finish the work in time ?

5. If 10 horses consume 18 bushels in 36 days. How long will 24 bushels last for 30 horses ?

6. A family of 5 persons can be maintained for 20 days with Rs. 2,480. Find, how long will Rs. 6,944 maintain a family of 8 persons ?

7. 90 men can complete a work in 24 days working 8 hours a day. How many men are working 8 hours a day. How many men are required to complete the same work in 18 days working $7\dfrac{1}{2}$ hours a day ?

8. Twelve typists, all working with same speed, type a certain number of pages in 18 days working 8 hours a day. Find, how many hours

per day must sixteen typists work in order to type the same number of pages in 9 days ?

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9. If 25 horses consume 18 quintal in 36 days, how long will 28 quintal last for 30 horses ?

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10. If 70 men dig 15,00 sq. m of a field in 5 days. Find how many men will dig 22,500 sq. m field

in 25 days ?

11. A contractor undertakes to build a wall 1000 m long in 50 days. He employs 56 men, but at the end of 27 days, he finds that only 448 m of wall is built. How many extra men must the contractor employ so that the wall is completed in time ?

12. A group of laboures promises to do a plece of work in 10 days, but five of them become absent. If the remaining labourers complete the work in 12 days. Find their original number in the group.

13. Ten men, working for 6 days of 10 hours each, finish $\dfrac{5}{21}$ of a piece of work. How many men working at the same rate and for the same number of hours each day, will be

required to complete the remaining work in 8 days ?

Exercise 10 E

1. A can do a piece of work in 10 days and B in 15 days. How long will they take to finish it working together ?

2. A and B together can do a piece of work in $6\dfrac{2}{3}$ days, but B along can do it in 10 days. How long will A take to do it alone ?

3. A can do a work in 15 days and B in 20 days. If they work together on it for 4 days, what fraction of the work will be left ?

4. A, B and C can do a piece of work in 6 days, 12 days and 24 days respectively. In what time will they altogether do it ?

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5. A and B working together can mow a field in 56 days and with the help of C , they could have mowed it in 42 days. How long would C take to mow the field by himself ?

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6. A can do a piece of work in 24 days, A and B can do it in 16 days and A,B and C in $10\dfrac{2}{3}$ days. In how many days can A and C do it working together ?

7. A can do a piece of work in 20 days and B in 15 days. They worked together on it for 6 days and then A left. How long will B take to finish the remaining work ?

8. A can finish a piece of work in 15 days and B can do it in 10 days. They worked together for 2 days and then B goes away. In how many days will A finish the remaining work ?

9. A can do a piece of work in 10 days, B in 18 days and A, B and C together in 4 days. In what time would C do it alone ?

10. A can do $\dfrac{1}{4}$ of a work in 5 days and B can do $\dfrac{1}{3}$ of the same work in 10 days. Find the number of days in which both working together will complete the work.

11. One tap can fill a cistern in 3 hours and the waste pipe can empty the full cistern in 5

hours. In what time will the empty cistern be full, if the tap and the waste pipe are kept open together ?

12. A and B can do a work in 8 days, B and C in 12 days, and A and C in 16 days. In what time can they do it, all working together ?

13. A and B complete a piece of work in 24 days, B and C do the same work in 36 days, and A, B and C together finish it in 18 days. In how many days will :

A alone,

14. A and B complete a piece of work in 24 days, B and C do the same work in 36 days, and A, B and C together finish it in 18 days. In how

many days will :

C alone,

15. A and B complete a piece of work in 24 days, B and C do the same work in 36 days, and A, B and C together finish it in 18 days. In how many days will :

A and C together, complete the work ?

16. A and B can do a piece of work in 40 days, B

and C in 30 days, and C and A in 24 days.

How long will it take them to do the work,

working together ?

17. A and B can do a piece of work in 40 days, B

and C in 30 days, and C and A in 24 days.

In what time can each finish it working alone ?

18. A can do a piece of work in 10 days, B in 12 days and C in 15 days. All begin together but A leaves the work after 2 days and B leaves 3 days befor the work is finished. How long did the work last ?

19. Two pipes P and Q would fill an empty cistern in 24 minutes and 32 minutes respectively. Both the pipes being opened

together, find when the first pipe must be turned off so that the empty cistern may be just filled in 16 minutes.