MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

DIRECT AND INVERSE VARIATIONS

Others

1. Consider a money lender who lends money on interest. We observe that if he lends more

money on a certain rate of interest, the interest earned will be more. In other words, if the money invested increases, the interest earned also increases and vice-versa. Thus, the money invested and the interest earned on it are in direct variation.

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2. If we consider the pressure and volume of a gas at a specific temperature we find that the increase in pressure leads to decrease in

volume and if the pressure is reduced, the volume will increase. Thus, the pressure and volume of a gas at a given temperature are not in direct variation.

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3. In which of the following tables, $a \ and \ b$ vary directly. Also, find the constant of variation if $a \ and \ b$ are in direct variation. (i) a: 4, 7, 21, 28 and b:12, 21, 63, 84 (ii) a: 2.5, 5, 7.5, 10,

15 and b:10, 20, 30, 40, 60 (iii) a:1, 2, 3, 4, 5 and

b:2, 1, 6, 3, 2/5

4. If $x \ and \ y$ vary directly, find the missing

entires in the following tables (i) x 2.5 ... ... 21 y

5 8 24 ... (ii) x ... 9 15 ... y 3 4.5 7.5 13.25

5. A car travels 432 km on 48 litres of petrol. How far would it travel on 20 litres of petrol ?

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6. If 40 metres of a cloth costs Rs 1940, how many metres can be brought for Rs 727.5?

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7. A private taxi charges a fare of Rs 260 for a journey of 200 km. How much would it travel for Rs 279. 50 ?

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8. Reema types 540 words during half an hour. How many words would she type in 6 minutes?

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9. The amount of extension in an elastic spring varies directly as the weight hung on it. If a weight of 150 gm produces an extension of 2.9 cm, then what weight would produce an extension of 17.4 cm?

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10. Explain the concept of direct variation.

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11. Which of the following quantities vary directly with each other? (i) Number of articles (x) and their price (y). (ii) Weight of articles (x) and their cost (y). (iii) Distance x and time y, speed remaining the same. (iv) Wages (y) and number of hours (x) of work. (v) Speed (x) and time (y) (distance covered remaining the same) (vi) Area of a land (x) and its cost (y).

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12. In which of the following tables a and b vary directly? (i) a: 7, 9, 13, 21, 25 b: 21, 27, 39, 63, 75 (ii) a: 10, 20, 30, 40, 46 b: 5, 10, 15, 20, 23 (iii) a: 1^2 , 2^2 , 3^2 , 4^2 , 5^2 b: 1^3 , 2^3 , 3^3 , 4^3 , 5^3

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13. Fill in the blanks in each of the following so as to make the statement true: (i) Two quantities are said to vary _____ with each other if they increase (decrease) together in

such a way that the ratio of the corresponding values remains same. (ii) $x \; and \; y$ are said to vary directly with each other if for some positive number k , _____ (iii) If $u \; = \; 3 \, v$, then u and v vary _____. with each other.

14. Complete the following tables given that x varies directly as y . (i) x, 2.5, ..., ..., 15 y, 5, 8, 12, ... (ii) x 5 ... 10 35 25 ... y 8 12 ... ... 21 (iii) x 6 8 10 ...

20 y 15 20 ... 40 ... (iv) x, 4, 9, ..., ..., 3, ... y, 16, ..., 48, 36, ..., 4 (v) x, 3, 5, 7, 9 y, ..., 20, 28, ...

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15. Find the constant of variation from the table given below: x, 3, 5, 7, 9 y, 12, 20, 28, 36 set up table and solve the following problems .

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16. Rohit bought 12 registers for Rs 156, find the cost of 7 such registers.

17. Anupama takes 125 minutes in walking a distance of 100 metre. What distance would she cover in 315 minutes?

18. If the cost of 93 m of a certain kind of plastic sheet is Rs 1395, then what would it cost to buy 105 m of such plastic sheet?

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19. Suneeta types 1080 words in one hour. What is her GWAM (gross words a minute rate)?

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20. A car is travelling at the average speed of 50 km/hr. How much distance would it travel in 12 minutes?

21. 68 boxes of a certain commodity require a shelf-length of 13.6 m. How many boxes of the same commodity would occupy a shelf length of 20.4 m?

22. In a library 136 copies of a certain book require a shelf-length of 3.4 metre. How many copies of the same book would occupy a shelf-length of 5.1 metres?

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23. The second class railway fare for 240 km of journey is Rs 15.00. What would be the fare for a journey of 139.2 km?

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24. If the thickness of a pile of 12 cardboards is 35 mm, find the thickness of a pile of 294 cardboards.

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25. The cost of 97 metre of cloth is Rs 242.50. What length of this can be purchased for Rs 302.50?

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26. 11 men can dig $6\frac{3}{4}$ metre long trench in one day. How many men should be employed for digging 27 metre long trench of the same type in one day?

27. A worker is paid Rs 210 for 6 days work. If his total income of the month is Rs 875, for how many days did he work?

28. A worker is paid Rs 200 for 8 days work. If he works for 20 days, how much will he get?

29. The amount of extension in an elastic string varies directly as the weight hung on it. If a weight of 150 gm produces an extension of 2.9 cm, what would produce an extension of 17.4 cm?

30. The amount of extension in an elastic spring varies directly with the weight hung on it. If a weight of 250 gm produces an extension of 3.5 cm, find the extension produced by the weight of 700 gm.

31. In 10 days, the earth picks up 2.6×10^8 pounds of dust from the atmosphere. How

much dust will it pick up in 45 days?

32. In 15 days, the earth picks up 1.2×10^8 kg of dust from the atmosphere. In how many days it will pick up 4.8×10^8 kg of dust?

33. In which of the following tables a and b vary inversely: (i) a

a	8	16	32	256
b	32	16	8	1

(ii)

a	9	18	2	12
b	8	4	30	6

(iii) a, 2, 16, 8, 4 b, 40, 5, 10, 20

34. If $a \ and \ b$ vary inversely, fill in the blanks: (i) a, 8, 2, ..., 5, 1 b, 10, ..., 20, ..., 80 (ii) a, 16, 32, 8, 128 b, 4, ..., ..., 0.5

35. If 52 men can do a piece of work in 35 days in how many days 28 men will do it ?

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36. If 56 men can do a piece of work in 42 days. How many men will do it in 14 days?

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37. Shalu cycles to her school at an average speed of 12 km/hr. It takes her 20 minutes to reach the school. If she wants to reach her school in 15 minutes, what should be her average speed?

38. 1000 soldiers in a fort had enough food for 20 days. but some soldiers were transferred to another fort and the food lasted for 25 days. How many soldiers were transferred ?

39. 120 men had food provision for 200 days. After 5 days, 30 men died due to an epidemic. How long will the remaining food last?

40. If $x \ and \ y$ vary inversely as each other, and $x = 10$ when $y = 6$. Find y when $x = 15$

41. In which of the following tables x and y vary inversely: (i) x, 4, 3, 12, 1 y, 6, 8, 2, 24 (ii) x, 5, 20, 10, 4 y, 9, 12, 8, 36 (iii) x, 4, 3, 6, 1 y, 9, 12, 8, 36 (iv) x 9 24 15 3 y 8 3 4 25

42. It x and y vary inversely, fill in the following blanks: (i) $x, 2, 16, ..., 8, ...$ $y, ..., 6, 4, ..., 0.25$ (ii) $x, 16, 32, 8, 128$

$y, 4, \ldots, \ldots, 0.25$ (iii) $x, 9, \ldots, 81, 243$

$y, 27, 9, \ldots, 1$

43. Which of the following quantities vary inversely as each other? The number of x men hired to construct a will and the time y takes to finish the job. The length x of a journey by bus and price y of the ticket Journey $(x\ km)$ undertaken by a car and the patrol $(y\ litres)$ consumed by it.

44. It is known that for a given mass of gas, the volume v varies inversely as the pressure p. Fill in the missing entries in the following table: $v \left(\in cm^3 \right)$ ... 48 60 ... 100 ... 200 $p \left(\in atmospheres \right)$ 2 ... 3/2 1 ... ...

45. If 36 men can do a piece of work in 25 days, in how many days will 15 men do it?

46. A work force of 50 men with a contractor can finish a piece of work in 5 months. In how many months the same work can be completed by 125 men?

47. A work-force of 420 men with a contractor can finish a certain piece of work in 9 months.

How many extra men must he employ to complete the job in 7 months?

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48. 1200 men can finish a stock of food in 35 days. How many more men should join them so that the same stock may last for 25 days?

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49. In a hostel of 50 girls, there are food provisions for 40 days. If 30 more girls join the hostel, how long will these provisions last?

50. A car can finish a certain journey in 10 hours at the speed of 48 km/hr. By how much should its speed be increased so that it may take only 8 hours to cover the same distance?

51. 1200 soldiers in a fort had enough food for 28 days. After 4 days, some soldiers were transferred to another fort and thus the food lasted now for 32 more days. How many soldiers left the fort?

52. Three spraying machines working together can finish painting a house in 60 minutes. How

long will it take for 5 machines of the same capacity to do the same job?

53. A group of 3 friends staying together, consume 54 kg of wheat every month. Some more friends join this group and they find that the same amount of wheat lasts for 18 days. How many new members are there in this group now?

54. 55 cows can graze a field in 16 days. How many cows will graze the same field in 10 days?

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55. 18 men can reap a field in 35 days. For reaping the same field in 15 days, how many men are required?

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56. A person has money to buy 25 cycles worth Rs 500 each. How many cycles he will be able to buy if each cycle is costing Rs 125 more?

57. Raghu has enough money to buy 75 machines worth $Rs. 200$ each. How many machines can he buy if he gets a discount of $Rs. 50$ on each machine ?

58. If $x \; and \; y$ vary inversely as each other and

$(i) x = 3$ when $y = 8$,   find y when $x = 4$

$(ii) x = 5$ when $y = 15$, find x when $y = 12$

$(iii) x = 3$, find y when constant of variation

$= 900.$ $(iv) y = 35$, find x when constant of

variation $= 7$.