

Exercise – 9.7

- Identify and solve the problems of direct and inverse variance.
1. If a girl can skip a rope 720 times in 1 hour. How many times can she skip in 35 minutes?
 2. If the heart of a human being beats 72 times in 1 minute. Find, in what time will the heartbeat 204 times.
 3. If 36 men can build a wall in 21 days, find how many men can build the same wall in 14 days.
 4. If a man can weave 450m cloth in 6 hours. How many meters of cloth can he weave in 14 hours?
 5. If a 162km long road can be constructed in 9 months. How many numbers of months are required to construct a 306 km long road?
 6. If 540 men can construct a building in 7 months. How many men should be removed from work to finish the building in 9 months?
 7. Asma can iron 5 shirts in 14 minutes. How long will she take to iron 35 shirts?
 8. 12 water pumps can make a water tank empty in 20 minutes. But 2 pumps are out of order. How long will the remaining pumps take to make the tank empty?
 9. 14 horses graze a field in 25 days. In how many days will 35 horses graze it?
 10. A mason can repair a 744m long track in 24 days. If he repairs 589m track, then find how many days will he take to repair the remaining track.
 11. A farmer can plough an area of 40 acres in 16 hours. How many acres will he plough in 36 hours?
 12. A dish washer deems 1350 dishes in 1 hour. How many dishes will it wash in 16 more minutes?
 13. If 150 shirts can be stitched on 6 sewing machines in a day, how many machines are required to stitch 225 shirts in a day?
 14. If 7 buffalos give 56 liters milk, how much milk can we get from 12 buffalos?

15. A farmer has 8 day's food for 33 cows. He bought 11 more cows. For how many days will the food be enough.
16. If 40 workers do a work in 35 days, in how many days will the same work be done by increasing 10 more workers.
17. Raheem paid his servant rupees 750 for 1 week and 3 days. What amount will he pay him for 30 days?
18. A machine starts working in 45 minutes at the temperature of 60 degree Celsius. How much time is required to work it at the temperature of 75 degree Celsius?
19. 72 persons have enough food for 7 days. But after one day they decided to finish the food in 3 remaining days. For it they invited more persons. How many persons did they invite?
20. Aliha takes 200 steps for walking a distance of 160m. Find the distance covered by her in 350 steps.
21. If a car needs 9 liters of petrol for a journey of 162km. Find how many liters of petrol is required for 306km.
22. An army camp of 200 men has enough food for 60 days. How long will the food last if the number of men in the camp is reduced to 160?
23. If the price of 12 eggs is Rs.96, how many eggs can be bought with Rs.80?
24. 10 men have ration for 21 days in a camp. If 3 men leave the camp, for how many days will the ration be sufficient for the remaining men?
25. 30 men repair a road in 56 days by working 6 hours daily. In how many days 45 men will repair the same road by working 7 hours daily?
26. If 60 women spin 48 kg of cotton by working 8 hours daily, how much cotton will 30 women spin by working 12 hours daily?
27. If the price of a carpet 8 meter long and 3m wide is Rs. 6288, what will be the price of 12 meter long and 6m wide carpet?
28. If 15 labors earn Rs. 67,500 in 9 days, how much money will 10 labors earn in 12 days?
29. 70 men can complete a wall of 150m length in 12 days. How many men will complete the wall of length 600m in 30 days?

- 6
30. If the fare of 12 quintal luggage for a distance of 18 km is 12 rupees, how much fare will be charged for a luggage of 9 quintals for a distance of 20 km?
31. 7 14 masons can build a wall 12 meters high in 12 days. How many masons will be needed to build a wall 120 meter high in 7 days?
32. 9 15 machines prepare 360 sweaters in 6 days. 3 machines get out of order. How many sweaters can be prepared in 10 days by the remaining machines?

men	day	hour	
30	56	6	
45	24	7	

$$\frac{30}{45} \times \frac{6}{7} = \frac{1}{56}$$

w un	kg	hours
60	48	8
30	24	12

27 Carried with Rs.

3 m	62.82
6 m	125.64
12 m	251.28

28 Lab Rs. days

↑ 15	67500	9
		↓ 15



...



1.

- 1 Find the skipping rate per minute:

$$720 \text{ skips} / 60 \text{ minutes} = 12 \text{ skips/minute.}$$

- 2 Calculate skips in 35 minutes: $12 \text{ skips/minute} * 35 \text{ minutes} = 420 \text{ skips.}$

Answer: 420 skips.

2.

- 1 Find the heartbeat rate per second: $72 \text{ beats} / 60 \text{ seconds} = 1.2 \text{ beats/second.}$

- 2 Calculate the time for 204 beats: $204 \text{ beats} / 1.2 \text{ beats/second} = 170 \text{ seconds.}$

Answer: 170 seconds.

3.

- 1 Find the total work: $36 \text{ men} * 21 \text{ days} = 756 \text{ man-days.}$

- 2 Calculate the number of men needed for 14 days: 756 man-days



...



- 2 Calculate the number of men needed for 14 days: 756 man-days / 14 days = 54 men.

Answer: 54 men.

4.

- 1 Find the weaving rate per hour:
 $450 \text{ meters} / 6 \text{ hours} = 75 \text{ meters/hour}$.
- 2 Calculate the cloth woven in 14 hours: $75 \text{ meters/hour} * 14 \text{ hours} = 1050 \text{ meters}$.

Answer: 1050 meters.

5.

- 1 Find the construction rate per kilometer: $9 \text{ months} / 162 \text{ km} = 0.0556 \text{ months/km}$
(approximately)
- 2 Calculate the time to construct 306 km: $0.0556 \text{ months/km} * 306 \text{ km} = 17 \text{ months}$.

Answer: 17 months.



...

**6.**

- 1 Find the total work: $540 \text{ men} * 7 \text{ months} = 3780 \text{ man-months.}$
- 2 Calculate the number of men needed for 9 months: $3780 \text{ man-months} / 9 \text{ months} = 420 \text{ men.}$
- 3 Calculate the number of men to remove: $540 \text{ men} - 420 \text{ men} = 120 \text{ men.}$

Answer: 120 men.

7.

- 1 Find the ironing rate per shirt: $14 \text{ minutes} / 5 \text{ shirts} = 2.8 \text{ minutes/shirt.}$
- 2 Calculate the time to iron 35 shirts: $2.8 \text{ minutes/shirt} * 35 \text{ shirts} = 98 \text{ minutes.}$

Answer: 98 minutes.

8.

- 1 Find the effective pumping rate: $12 \text{ pumps} * 20 \text{ minutes} = 240$



...

**8.**

- 1 Find the effective pumping rate:

$$12 \text{ pumps} * 20 \text{ minutes} = 240 \text{ pump-minutes.}$$

- 2 Calculate the time for 10 pumps:

$$240 \text{ pump-minutes} / 10 \text{ pumps} = 24 \text{ minutes.}$$

Answer: 24 minutes.

9.

- 1 Find the total grazing work: 14 horses * 25 days = 350 horse-days.

- 2 Calculate the number of days for 35 horses: $350 \text{ horse-days} / 35 \text{ horses} = 10 \text{ days.}$

Answer: 10 days.

10.

- 1 Calculate the remaining track length: $744\text{m} - 589\text{m} = 155\text{m.}$

- 2 Find the repair rate per meter: $24 \text{ days} / 744\text{m} = 0.0323 \text{ days/meter}$



...



- 2 Find the repair rate per meter: $24 \text{ days} / 744\text{m} = 0.0323 \text{ days/meter}$ (approximately)
- 3 Calculate the time to repair the remaining track: $0.0323 \text{ days/meter} * 155\text{m} = 5 \text{ days.}$

Answer: 5 days.

11.

- 1 Find the ploughing rate per hour: $40 \text{ acres} / 16 \text{ hours} = 2.5 \text{ acres/hour.}$
- 2 Calculate the area ploughed in 36 hours: $2.5 \text{ acres/hour} * 36 \text{ hours} = 90 \text{ acres.}$

Answer: 90 acres.

12.

- 1 Find the washing rate per minute: $1350 \text{ dishes} / 60 \text{ minutes} = 22.5 \text{ dishes/minute.}$
- 2 Calculate the number of dishes washed in 16 minutes: 22.5



...



- 2 Calculate the number of dishes washed in 16 minutes: 22.5 dishes/minute * 16 minutes = 360 dishes.

Answer: 360 dishes.

13.

- 1 Find the stitching rate per machine: 150 shirts / 6 machines = 25 shirts/machine.
- 2 Calculate the number of machines needed for 225 shirts: 225 shirts / 25 shirts/machine = 9 machines.

Answer: 9 machines.

14.

- 1 Find the milk yield per buffalo: 56 liters / 7 buffalos = 8 liters/buffalo.
- 2 Calculate the milk yield from 12 buffalos: 8 liters/buffalo * 12 buffalos = 96 liters.

Answer: 96 liters.

15.

- 1 Total food units = $33 \text{ cows} * 8 \text{ days}$
 $= 264 \text{ cow-days.}$
- 2 New number of cows = $33 + 11 =$
 44 cows.
- 3 Number of days food will last =
 $264 \text{ cow-days} / 44 \text{ cows} = 6 \text{ days.}$

Answer: 6 days.

16.

- 1 Total work units = $40 \text{ workers} * 35 \text{ days}$
 $= 1400 \text{ worker-days.}$
- 2 New number of workers = $40 + 10 = 50 \text{ workers.}$
- 3 Number of days to complete work
 $= 1400 \text{ worker-days} / 50 \text{ workers} = 28 \text{ days.}$

Answer: 28 days.

17.

- 1** Weeks in 30 days = $30 \text{ days} / 7 \text{ days/week} \approx 4.29 \text{ weeks.}$
- 2** Cost per week = $750 \text{ rupees} / (1 \text{ week} + 3/7 \text{ week}) = 750 \text{ rupees} / (10/7 \text{ week}) = 525 \text{ rupees/week.}$
- 3** Total cost for 30 days = $525 \text{ rupees/week} * 4.29 \text{ weeks} \approx 2250 \text{ rupees.}$

Answer: Approximately 2250 rupees.

18. This problem lacks sufficient information to solve. The relationship between temperature and working time isn't provided.

19.

- 1** Initial food units = $72 \text{ persons} * 7 \text{ days} = 504 \text{ person-days.}$
- 2** Food consumed in one day = $72 \text{ persons} * 1 \text{ day} = 72 \text{ person-days.}$
- 3** Remaining food units = $504 \text{ person-days} - 72 \text{ person-days} = 432 \text{ person-days.}$

432 person-days.

- 4 Number of persons needed to finish in 3 days = 432 person-days / 3 days = 144 persons.
- 5 Number of persons invited = 144 persons - 72 persons = 72 persons.

Answer: 72 persons.

20.

- 1 Distance per step = 160m / 200 steps = 0.8m/step.
- 2 Distance covered in 350 steps = 0.8m/step * 350 steps = 280m.

Answer: 280m.

21.

- 1 Petrol consumption rate = 9 liters / 162km = 1/18 liters/km.
- 2 Petrol needed for 306km = (1/18 liters/km) * 306km = 17 liters.

Answer: 17 liters.

22.

- 1 Total food units = $200 \text{ men} * 60 \text{ days} = 12000 \text{ man-days.}$
- 2 New number of men = 160 men.
- 3 Number of days food will last =
 $12000 \text{ man-days} / 160 \text{ men} = 75 \text{ days.}$

Answer: 75 days.

23.

- 1 Price per egg = $96 \text{ rupees} / 12 \text{ eggs} = 8 \text{ rupees/egg.}$
- 2 Number of eggs for 80 rupees =
 $80 \text{ rupees} / 8 \text{ rupees/egg} = 10 \text{ eggs.}$

Answer: 10 eggs.

24.

- 1 Total ration units = $10 \text{ men} * 21 \text{ days} = 210 \text{ man-days.}$
- 2 Remaining men = $10 \text{ men} - 3 \text{ men} = 7 \text{ men.}$

- 2 Remaining men = 10 men - 3 men
= 7 men.
- 3 Number of days ration will last =
 $210 \text{ man-days} / 7 \text{ men} = 30 \text{ days.}$

Answer: 30 days.

25.

- 1 Total work units = $30 \text{ men} * 56 \text{ days} * 6 \text{ hours/day} = 10080 \text{ man-hours.}$
- 2 New number of men = 45 men.
- 3 New working hours per day = 7 hours/day.
- 4 Number of days to complete work = $10080 \text{ man-hours} / (45 \text{ men} * 7 \text{ hours/day}) = 32 \text{ days.}$

Answer: 32 days.

26.

- 1 Total work units = $60 \text{ women} * 8 \text{ hours/day} = 480 \text{ woman-hours.}$
- 2 Cotton spun per woman-hour =
 $48\text{kq} / 480 \text{ woman-hours} = 0.1$

- 2 Cotton spun per woman-hour =
 $48\text{kg} / 480 \text{ woman-hours} = 0.1 \text{ kg/woman-hour.}$
- 3 New work units = $30 \text{ women} * 12 \text{ hours/day} = 360 \text{ woman-hours.}$
- 4 Total cotton spun = $0.1 \text{ kg/woman-hour} * 360 \text{ woman-hours} = 36 \text{ kg.}$

Answer: 36 kg.

27.

- 1 Area of first carpet = $8\text{m} * 3\text{m} = 24 \text{ sq m.}$
- 2 Price per sq m = $6288 \text{ rupees} / 24 \text{ sq m} = 262 \text{ rupees/sq m.}$
- 3 Area of second carpet = $12\text{m} * 6\text{m} = 72 \text{ sq m.}$
- 4 Price of second carpet = $262 \text{ rupees/sq m} * 72 \text{ sq m} = 18864 \text{ rupees.}$

Answer: 18864 rupees.

28.

- 1 Total earnings per labor-day =
$$67500 \text{ rupees} / (15 \text{ labors} * 9 \text{ days})$$
$$= 500 \text{ rupees/labor-day.}$$
- 2 Total labor-days = 10 labors * 12
days = 120 labor-days.
- 3 Total earnings = 500
rupees/labor-day * 120 labor-days
= 60000 rupees.

Answer: 60000 rupees.

29.

- 1 Total work units = 70 men * 12
days = 840 man-days.
- 2 Work units per meter = 840 man-
days / 150m = 5.6 man-days/m.
- 3 Total work units for 600m wall

Problem 30:

- 1 Fare per quintal per km = 12 rupees / (12 quintals * 18 km) = 1/18 rupees/quintal-km.
- 2 Fare for 9 quintals for 20 km = (1/18 rupees/quintal-km) * 9 quintals * 20 km = 10 rupees.

Answer: 10 rupees.

Problem 31:

- 1 Total work done by 14 masons in 12 days = 14 masons * 12 days = 168 mason-days.
- 2 Work per meter = 168 mason-days / 12 meters = 14 mason-days/meter.
- 3 Total mason-days needed for 120 meters = 14 mason-days/meter * 120 meters = 1680 mason-days.
- 4 Number of masons needed for 7 days = 1680 mason-days / 7 days = 240 masons.

Answer: 240 masons.

Answer: 240 masons.

Problem 32:

- 1 Sweaters prepared per machine per day = $360 \text{ sweaters} / (15 \text{ machines} * 6 \text{ days}) = 4 \text{ sweaters/machine-day.}$
- 2 Number of working machines = $15 \text{ machines} - 3 \text{ machines} = 12 \text{ machines.}$
- 3 Sweaters prepared in 10 days by 12 machines = $4 \text{ sweaters/machine-day} * 12 \text{ machines} * 10 \text{ days} = 480 \text{ sweaters.}$

Answer: 480 sweaters.