

Chapter: Direct and inverse proportions**Page no.: 162****Exercise: 12A****Question 1:**

(i)

Solution: Clearly, $\frac{x}{y} = \frac{3}{9} = \frac{5}{15} = \frac{8}{24} = \frac{11}{33} = \frac{26}{78} = \frac{1}{3}$ (constant)

Therefore, x and y are proportional.

(ii)

Solution: Clearly, $\frac{x}{y} = \frac{2.5}{10} = \frac{4}{16} = \frac{7.5}{30} = \frac{10}{40} = \frac{1}{4}$, while $\frac{14}{42} = \frac{1}{3}$

i.e., $\frac{2.5}{10} = \frac{4}{16} = \frac{7.5}{30} = \frac{10}{40}$ is not equal to $\frac{14}{42}$. Therefore, x and y are not proportional.

(iii)

Solution: Clearly, $\frac{x}{y} = \frac{5}{15} = \frac{7}{21} = \frac{9}{27} = \frac{25}{75} = \frac{1}{3}$, while $\frac{15}{60} = \frac{18}{72} = \frac{1}{4}$

i.e., $\frac{5}{15} = \frac{7}{21} = \frac{9}{27} = \frac{25}{75}$ is not equal to $\frac{15}{60}$ and $\frac{18}{72}$. Therefore, x and y are not proportional.

Question 2:

Solution: Since x and y are directly proportional, we have: $\frac{3}{72} = \frac{x_1}{120} = \frac{x_2}{192} = \frac{10}{y_1}$ Now, $\frac{3}{72} = \frac{x_1}{120}$

$$x_1 = \frac{120 \times 3}{72} = 5 \text{ and, } \frac{3}{72} = \frac{x_2}{192}$$

$$x_2 = \frac{3 \times 192}{72} = 8$$

$$\text{And, } \frac{3}{72} = \frac{10}{y_1}$$

$$y_1 = \frac{72 \times 10}{3} = 240$$

Therefore, $x_1 = 5$, $x_2 = 8$ and $y_1 = 240$

Question 3:**Solution:**

Let the required distance be x km. Then, we have:

Quantity of diesel (in liters)	34	20
Distance (in km)	510	x

Clearly, the less the quantity of diesel consumed, the less is the distance covered.
So, this is a case of direct proportion.

$$\text{Now, } \frac{34}{510} = \frac{20}{x}$$

$$\frac{1}{15} = \frac{20}{x}$$

$$X \times 1 = 20 \times 15 = 300$$

therefore, the required distance is 300 km.

Question 4:

Solution:

Let the charge for a journey of 124 km be Rs. x .

Price(in Rs.)	2550	x
Distance(in km)	150	124

More is the distance travelled, more will be the price.

So, it is a case of direct proportion.

$$\therefore \frac{2550 \times 124}{150} = \frac{x}{124}$$

$$x = \frac{2550 \times 124}{150} = 2108$$

Thus, the taxi charges Rs. 2,108 for the distance of 124 km.

Question 5:

Solution:

Let the required distance be x km. Then, we have: 1 h=60 minute. 5 h=5×60=300 min.

Distance (in km)	16	x
Time (in min)	25	300

Clearly, the more the time taken, the more will be the distance covered.

So, this is a case of direct proportion.

$$\text{Now, } \frac{16}{25} = \frac{x}{300}$$

$$x = \frac{16 \times 300}{25}$$

$$x = 192$$

Therefore, the required distance is 192 km.

Question 6:

Solution:

Let the required number of dolls be x . Then, we have:

No of dolls	18	x
Cost of dolls (in rupees)	630	455

Clearly, the less the amount of money, the less will be the number of dolls bought.
So, this is a case of direct proportion.

$$\begin{aligned}\text{Now, } \frac{18}{630} &= \frac{x}{455} \\ \frac{1}{35} &= \frac{x}{455} \\ X &= \frac{455}{35} \\ x &= 13\end{aligned}$$

Therefore, 13 dolls can be bought for Rs 455.

Question 7:

Solution:

Let the quantity of sugar bought for 371 be x kg.

Quantity(in kg)	9	x
Price	238.50	371

The price increases as the quantity increases. Thus, this is a case of direct proportion

$$\begin{aligned}\therefore \frac{9}{238.50} &= \frac{x}{371} \\ X &= \frac{9 \times 371}{238.50} = 14\end{aligned}$$

Thus, the quantity of sugar bought for 371 is 14 kg.

Question 8:

Solution:

Let the length of cloth be x m. Then, we have:

Length of cloth (in meters)	15	x
Cost of cloth (in rupees)	981	1308

Clearly, more length of cloth can be bought by more amount of money.

So, this is a case of direct proportion.

$$\begin{aligned}\text{Now, } \frac{15}{981} &= \frac{x}{1308} \\ x &= \frac{15 \times 1308}{981} \\ x &= 20\end{aligned}$$

Therefore, 20 m of cloth can be bought for Rs 1,308.

Question 9:

Solution:

Let x m be the length of the model of the ship. Then, we have:

1 m = 100 cm

Therefore, 15 m = 1500 cm

35 m = 3500 cm

	Length of the mast (in cm)	Length of the ship (in cm)
Actual ship	1500	3500
Model of the ship	9	x

Clearly, if the length of the actual ship is more, then the length of the model ship will also be more.

So, this is a case of direct proportion.

$$\text{Now, } \frac{1500}{9} = \frac{3500}{x}$$

$$X = \frac{3500 \times 9}{1500}$$

$$X = 21 \text{ cm}$$

Therefore, the length of the model of the ship is 21 cm.

Question 10:

Solution:

Let x kg be the required amount of dust. Then, we have:

No. of days	8	15
Dust (in kg)	6.4×10^7	X

Clearly, more amount of dust will be collected in more number of days.

So, this is a case of direct proportion.,

$$\text{Now } \frac{8}{6.4 \times 10^7} = \frac{15}{x}$$

$$X = \frac{15 \times 6.4 \times 10^7}{8}$$

$$X = 12 \times 10^7$$

Therefore, 12, 00, 00,000 kg of dust will be picked up in 15 days.

Question 11:

Solution:

Let x km be the required distance. Then, we have:

1 h = 60 minute.

i.e. 1h 12 min = (60+12) min = 72 min

Distance covered (in km)	50	x
Time (in min)	60	72

Clearly, more distance will be covered in more time.

So, this is a case of direct proportion

$$\text{Now, } \frac{50}{60} = \frac{x}{72}$$

$$x = \frac{50 \times 72}{60}$$

$$x = 60$$

Therefore, the distance travelled by the car in 1 h 12 min is 60 km.

Question 12:

Solution:

Let x km be the required distance covered by Ravi in 2 h 24 min.

Then, we have:

$$1 \text{ h} = 60 \text{ min}$$

$$\text{i.e., } 2 \text{ h } 24 \text{ min} = (120 + 24) \text{ min} = 144 \text{ min}$$

Distance covered (in km)	5	x
Time (in min)	60	144

Clearly, more distance will be covered in more time.

So, this is a case of direct proportion.

$$\text{Now, } \frac{5}{60} = \frac{x}{144}$$

$$x = \frac{5 \times 144}{60}$$

$$x = 12$$

Therefore, the distance covered by Ravi in 2 h 24 min is 12 km.

Question 13:

Solution:

Let x mm be the required thickness. Then, we have:

Thickness of cardboard (in mm)	65	x
No. of cardboards	12	312

Clearly, when the number of cardboard is more, the thickness will also be more.

So, it is a case of direct proportion.

$$\text{Now, } \frac{65}{12} = \frac{x}{312}$$

$$x = \frac{65 \times 312}{12}$$

$$x = 1690$$

Therefore, the thickness of the pile of 312 cardboards is 1690 mm.

Question 14:**Solution:**

Let x be the required number of men.

$$\text{Now, } 6\frac{3}{4} \text{ m} = \frac{27}{4} \text{ m}$$

Then, we have:

Number of men	11	x
Length of trench (in meters)	$\frac{27}{4}$	27

Clearly, the longer the trench, the greater will be the number of men required.
So, it is a case of direct proportion.

$$\begin{aligned} \text{Now, } \frac{11}{27/4} &= \frac{x}{27} \\ \frac{11 \times 4}{27} &= \frac{x}{27} \\ x &= 44 \end{aligned}$$

Therefore, 44 men should be employed to dig a trench of length 27 m.

Question 15:**Solution:**

Let Reenu type x words in 8 minutes.

No. of words	540	x
Time taken (in min)	30	8

Clearly, less number of words will be typed in less time.
So, it is a case of direct proportion.

$$\begin{aligned} \text{Now, } \frac{540}{30} &= \frac{x}{8} \\ x &= \frac{540 \times 8}{30} \\ x &= 144 \end{aligned}$$

Therefore, Reenu will type 144 words in 8 minutes.

Exercise: 12B**Page no.: 165****Question 1:**

(i)

Solution; Clearly, $6 \times 9 \neq 10 \times 15 \neq 14 \times 21 \neq 16 \times 24$
Therefore, x and y are not inversely proportional.

(ii)

Solution: Clearly, $5 \times 18 = 9 \times 10 = 15 \times 6 = 3 \times 30 = 45 \times 2 = 90 = (\text{constant})$
Therefore, x and y are inversely proportional.

(iii)

Solution: Clearly, $9 \times 4 = 3 \times 12 = 36 \times 1 = 36$, while $6 \times 9 = 54$
i.e., $9 \times 4 = 3 \times 12 = 36 \times 1 \neq 6 \times 9$
Therefore, x and y are not inversely proportional.

Question 2:**Solution:**

Since x and y are inversely proportional, xy must be a constant.

Therefore, $8 \times y_1 = x_1 \times 4 = 16 \times 5 = x_2 \times 2 = 80 \times y_2$

Now, $16 \times 5 = 8 \times y_1$

$$\frac{80}{8} = y_1$$

$$\therefore y_1 = 10$$

$$16 \times 5 = x_1 \times 4$$

$$\frac{80}{4} = x_1$$

$$\therefore x_1 = 20$$

$$16 \times 5 = x_2 \times 2$$

$$\frac{80}{2} = x_2$$

$$\therefore x_2 = 40$$

$$16 \times 5 = 80 \times y_2$$

$$\frac{80}{80} = y_2$$

$$\therefore y_2 = 1$$

Hence, $y_1 = 10$, $x_1 = 20$, $x_2 = 40$ and $y_2 = 1$

Question 3:**Solution:**

Let x be the required number of days. Then, we have:

No. of days	8	x
No. of men	35	20

Clearly, less men will take more days to reap the field.

So, it is a case of inverse proportion.

Now, $8 \times 35 = x \times 20$

$$\frac{8 \times 35}{20} = x$$

$$14 = x$$

Therefore, 20 men can reap the same field in 14 days.

Question 4:

Solution: Let x be the required number of men. Then, we have:

No. of days	8	6
No. of men	12	x

Clearly, more men will require less number of days to dig the pond.

So, it is a case of inverse proportion.

Now, $8 \times 12 = 6 \times x$

$$x = \frac{8 \times 12}{6}$$

$$x = 16$$

Therefore, 16 men can dig the pond in 6 days.

Question 5:**Solution:**

Let x be the number of days. Then, we have:

No. of days	28	x
No. of cows	6	14

Clearly, more number of cows will take less number of days to graze the field.

So, it is a case of inverse proportion.

Now, $28 \times 6 = x \times 14$

$$x = \frac{28 \times 6}{14}$$

$$x = 12$$

Therefore, 14 cows will take 12 days to graze the field.

Question 6:**Solution:**

Let x h be the required time taken. Then, we have:

Speed (in km/h)	60	75
Time (in h)	5	x

Clearly, the higher the speed, the lesser will be the the time taken.

So, it is a case of inverse proportion.

Now, $60 \times 5 = 75 \times x$

$$x = \frac{60 \times 5}{75}$$

$$x = 4$$

Therefore, the car will reach its destination in 4 h if it travels at a speed of 75 km/h.

Question 7:**Solution:**

Let x be the number of machines required to produce same number of articles in 48.

Then, we have:

No. of machines	42	x
No. of days	56	48

Clearly, less number of days will require more number of machines.

So, it is a case of inverse proportion.

Now, $42 \times 56 = x \times 48$

$$\Rightarrow x = \frac{42 \times 56}{48}$$

$$\Rightarrow x = 49$$

Therefore, 49 machines would be required to produce the same number of articles in 48 days.

Question 8:**Solution:**

Let x be the required number of taps. Then, we have:

1 h = 60 min

i.e., 1 h 36 min = $(60+36)$ min = 96 min

No. of taps	7	8
Time (in min)	96	x

Clearly, more number of taps will require less time to fill the tank.

So, it is a case of inverse proportion.

Now, $7 \times 96 = 8 \times x$

$$x = \frac{7 \times 96}{8}$$

$$x=84$$

Therefore, 8 taps of the same size will take 84 min or 1 h 24 min to fill the tank.

Question 9:

Solution:

Let x min be the required number of time. Then, we have:

No. of taps	8	6
Time (in min)	27	x

Clearly, less number of taps will take more time to fill the tank .

So, it is a case of inverse proportion.

Now, $8 \times 27 = 6 \times x$

$$x = \frac{8 \times 27}{6}$$

$$x = 36$$

Therefore, it will take 36 min to fill the tank.

Question 10:

Solution:

Let x be the required number of days. Then, we have:

No. of days	9	X
No. of animals	28	36

Clearly, more number of animals will take less number of days to finish the food.

So, it is a case of inverse proportion.

Now, $9 \times 28 = x \times 36$

$$x = \frac{9 \times 28}{36}$$

$$x = 7$$

Therefore, the food will last for 7 days.

Question 11:

Solution:

Let x be the required number of days. Then, we have:

No. of men	900	1400
No. of days	42	x

Clearly, more men will take less number of days to finish the food.

So, it is a case of inverse proportion.

Now, $900 \times 42 = 1400 \times x$

$$x = \frac{900 \times 42}{1400}$$

$$x=27$$

Therefore, the food will now last for 27 days.

Question 12:

Solution:

Let x be the required number of days. Then, we have:

No. of students	75	60
No. of days	24	x

Clearly, less number of students will take more days to finish the food.

So, it is a case of inverse proportion.

Now, $75 \times 24 = 60 \times x$

$$x = \frac{75 \times 24}{60}$$

$$x=30$$

Therefore, the food will now last for 30 days.

Question 13:

Solution:

Let x min be the duration of each period when the school has 8 periods a day.

No. of periods	9	8
Time (in min)	40	x

Clearly, if the number of periods reduces, the duration of each period will increase.

So, it is a case of inverse proportion.

Now, $9 \times 40 = 8 \times x$

$$x = \frac{9 \times 40}{8}$$

$$x=45$$

Therefore, the duration of each period will be 45 min if there were eight periods a day.

Question 14:

Solution:

x	15	9
y	6	y_1

x and y vary inversely. i.e. $xy = \text{constant}$

Now, $15 \times 6 = 9 \times y_1$

$$y_1 = 15 \times 69$$

$$y_1=10$$

∴ Value of $y=10$, when $x=9$

Question 15:

Solution:

x	18	x_1
y	8	16

x and y vary inversely.i.e. $xy = \text{constant}$

Now, $18 \times 8 = x_1 \times 16$

$$\frac{18 \times 8}{16} = x_1$$

$$9 = x_1$$

∴ Value of $x=9$

Exercise: 12 C

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Question 1:

Solution: Let 22 kg of pulses cost x .

Quantity(in kg)	14	22
Price(in Rs)	882	x

As the quantity increases, the price also increases.

So, it is a case of direct proportion.

$$\therefore \frac{14}{882} = \frac{22}{x}$$

$$X = \frac{22 \times 882}{14} = 1386$$

Thus, the cost of 22 kg of pulses is Rs 1,386.

Hence, the correct Solution is option (d).

Question 2:

Solution: Let the number of oranges that can be bought for Rs. 169 be x .

Quantity	8	x
Price(in Rs.)	52	169

As the quantity increases the price also increases.

So, this is a case of direct proportion.

$$\therefore \frac{8}{52} = \frac{x}{169}$$

$$X = \frac{8 \times 169}{52} = 26$$

Thus, 26 oranges can be bought for Rs. 169.
Hence, the correct Solution is option (c).

Question 3:

Solution:

(b) 700

Let x be the number of bottles filled in 5 hours.

No. of bottles	420	x
Time (h)	3	5

More number of bottles will be filled in more time.

$$\begin{aligned} \text{Now, } \frac{420}{3} &= \frac{x}{5} \\ x &= \frac{420 \times 5}{3} \\ x &= 700 \end{aligned}$$

Therefore, 700 bottles would be filled in 5 h.

Question 4:

Solution:

(a) 25 km

Let x km be the required distance.

Now, 1 h = 60 min

Distance (in km)	75	x
Time (in min)	60	20

Less distance will be covered in less time.

$$\begin{aligned} \text{Now, } \frac{75}{60} &= \frac{x}{20} \\ x &= \frac{75 \times 20}{60} \\ x &= 25 \text{ km} \end{aligned}$$

Question 5:**Solution:**

(c) 300

Let x sheets weigh 1 kg.

Now, 1 kg = 1000 g

No. of sheets	12	X
Weight (in g)	40	1000

$$\text{Now, } \frac{12}{40} = \frac{x}{1000}$$

$$x = \frac{12 \times 1000}{40}$$

$$x = 300$$

Question 6:**Solution:**

(b) 9.8 m

Let x m be the height of the tree.

Height of object	14	x
Length of shadow	10	7

The more the length of the shadow, the more will be the height of the tree.

$$\text{Now, } \frac{14}{10} = \frac{x}{7}$$

$$x = \frac{14 \times 7}{10}$$

$$x = 9.8$$

Therefore, a 9.8 m tall tree will cast a shadow of length 7 m.

Question 7:**Solution:** (c) 10^{-4} cmLet x cm be the actual length of the bacteria.

The larger the object, the larger its image will be.

$$\text{Now, } \frac{x}{1} = 550000 = 10^{-4} \text{ cm}$$

Hence, the actual length of the bacteria is 10^{-4} cm.**Question 8:****Solution:**

(b) 144 min

Let x min be the time taken by 5 pipes to fill the tank.

No. of pipes	6	5
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Time (in min)	120	X
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Now, $6 \times 120 = 5 \times x$

$$x = 144$$

Therefore, 5 pipes will take 144 min to fill the tank.

Question 9:

Solution:

(b) 3 days

Let x be number of days taken by 4 persons to build the wall.

No. of persons	3	4
No. of days	4	x

More number of persons will take less time to build the wall.

So, it is a case of inverse proportion.

Now, $3 \times 4 = 4 \times x \Rightarrow x = 3$

Therefore, 4 persons can build the wall in 3 days.

Question 10:

Solution:

(a) 1 h 30 min

Let x h be the time taken by the car travelling at 80 km/hr.

Speed (km/h)	60	80
Time (in h)	2	x

The greater the speed, the lesser will be the time taken.

So, it is a case of inverse proportion.

Now, $60 \times 2 = 80 \times x$

$$x = \frac{120}{80}$$

$x = 1.5$ Therefore, the car will take 1 h 30 min to reach its destination if it travels at a speed of 80 km/h.

Test paper

Page no. - 168

A Question 1:

Solution:

Let x be the required number of boxes.

No. of boxes	350	x
No. of cartons	25	16

Less number of boxes will require less number of cartons.

So, it is a case of direct proportion.

$$\begin{aligned}\text{Now, } \frac{350}{25} &= \frac{x}{16} \\ x &= \frac{350 \times 16}{25} \\ x &= 224\end{aligned}$$

∴ 224 boxes can be placed in 16 cartoons.

Question 2:

Solution:

Let Rs x be the cost of 24 tennis balls.

No. of balls	140	24
Cost of balls	4900	x

More tennis balls will cost more.

$$\begin{aligned}\text{Now, } \frac{140}{4900} &= \frac{24}{x} \\ x &= \frac{24 \times 4900}{140} \\ x &= 840\end{aligned}$$

∴ The cost of 2 dozen tennis balls is Rs 840.

Question 3:

Solution:

Let Rs x be the railway fare for a journey of distance 53 km.

Distance (in km)	61	53
Railway fare (in rupees)	183	x

The lesser the distance, the lesser will be the fare.

So, it is a case of direct proportion.

$$\begin{aligned}\text{Now, } \frac{61}{183} &= \frac{53}{x} \\ X &= \frac{53 \times 183}{61} \\ x &= 159\end{aligned}$$

The railway fare for a journey of distance 53 km is Rs 159.

Question 4:

Solution:

Let x people dig the trench in 4 days.

No. of people	10	x
No. of days	6	4

More people will take less number of days to dig the trench.
Hence, this is a case of inverse proportion.

Now, $10 \times 6 = x \times 4$

$$x = \frac{60}{4}$$

$$x = 15$$

\therefore 15 people can dig the trench in 4 days.

Question 5:

Solution:

Let x be the number of days taken by 21 men to finish the piece of work.

No. of men	30	21
No. of days	28	x

More men will take less time to complete the work.
So, this is a case of inverse proportion.

Now, $30 \times 28 = 21 \times x$

$$x = \frac{30 \times 28}{21}$$

$$x = 40$$

\therefore 21 men will take 40 days to finish the piece of work.

Question 6:

Solution:

Clearly, the remaining food is sufficient for 200 men for $(45 - 15)$, i.e., 30 days.

Total number of men = $200 + 40 = 240$

Let the remaining food last for x days.

No. of men	200	240
No. of days	30	x

Clearly, more men will take less number of days to finish the food.
So, it is a case of inverse proportion.

Now, $200 \times 30 = 240 \times x$

$$x = \frac{200 \times 30}{240}$$

$$x = 25$$

\therefore The remaining food will last for 25 days.

B. mark () against the correct answer in each of the following:

Question 7:

Solution:

(d) 144 minutes

Let one pipe take x min to fill the tank.

No. of pipe	6	1
Time(in min)	24	x

Clearly, one pipe will take more time to fill the tank.

So, it is a case of inverse proportion.

Now, $6 \times 24 = 1 \times x$

$$x = 6 \times 24$$

$$x = 144$$

\therefore One pipe can fill the tank in 144 minutes.

Question 8:

Solution: (d) 588 days

Let one worker take x days to build the wall.

No. of workers	14	1
No. of days	42	x

Clearly, one worker will take more days to finish the work.

So, it is a case of inverse proportion.

Now, $14 \times 42 = 1 \times x$

$$x = 14 \times 42$$

$$x = 588$$

\therefore One worker can build the wall in 588 days.

Question 9:

Solution: (a) 14 days

Let 20 men take x days to reap the field.

No. of days	8	x
No. of men	35	20

Clearly, less number of men will take more days.

So, it is a case of inverse proportion.

Now, $8 \times 35 = x \times 20$

$$x = \frac{8 \times 35}{20}$$

$$x = 14$$

\therefore 20 men can reap the field in 14 days.

Question 10:

Solution: (b) 72 km

Let x km be the distance covered in 1 h 12 min.

Now, 1 h 12 min = $(60+12)$ min = 72 min

Distance(in km)	60	x
Time(in min)	60	72

More distance will be covered in more time.

So, it is a case of direct proportion.

$$\text{Now, } \frac{60}{60} = \frac{x}{72}$$

$$x = 72 \text{ km}$$

\therefore The car will cover a distance of 72 km in 1 h 12 min.

Question 11:

Solution: (c) 170 words

Let x be the number of words typed by Rashmi in 10 minutes.

No. of words	510	x
Time(in min)	30	10

Less time will be taken to type less number of words.

So, it is a case of direct variation.

$$\text{Now, } \frac{510}{30} = \frac{x}{10}$$

$$X = 170$$

\therefore Rashmi will type 170 words in 10 minutes.

Question 12:

Solution: (c) 8

x	3	x_1
y	36	96

x and y vary directly. Then $x = ky$, where k is the constant of proportionality. $\Rightarrow k = \frac{x}{y}$

$$\text{Now, } \frac{3}{36} = \frac{x_1}{96}$$

$$\frac{96 \times 30}{36} = x_1$$

$$8 = x_1$$

\therefore Value of $x = 8$

Question 13:

Solution: (a) 10

x	15	9
y	6	y_1

Since x and y vary inversely, $xy = \text{constant}$

Now, $15 \times 6 = 9 \times y_1$

$$\frac{90}{9} = y_1$$

$$10 = y_1$$

\therefore Value of $y = 10$, when $x = 9$.

C. Question 14.

(i)

Solution: Let x be the number of days taken by 4 persons to complete the work.

No. of days	4	x
No. of persons	3	4

Clearly, more workers will take less number of days.

So, it is a case of inverse proportion.

Now, $4 \times 3 = x \times 4$

$$x = 3$$

Therefore, 4 persons can do the piece of work in 3 days.

(ii)

Solution: Let x min be the time taken by 6 pipes to fill the tank.

No. of pipes	5	6
Time (in min)	144	x

Clearly, more number of pipes will take less time to fill the tank.

So, it is a case of inverse proportion.

Now, $5 \times 144 = 6 \times x$

$$x = \frac{5 \times 144}{6}$$

$$x = 120 \text{ min}$$

\therefore 6 pipes can fill the tank in 120 min.

(iii)

Solution: Let x min be the time taken by the car travelling at 45 km/h.

Now, 1 h 30 min = (60+30) min

Speed(in km/hr)	60	45
Time(in min)	90	x

Clearly, a car travelling at a less speed will take more time.

So, it is a case of inverse proportion.

Now, $60 \times 90 = 45 \times x$

$$x = \frac{60 \times 90}{45}$$

$$x = 120 \text{ min} = 2 \text{ h}$$

\therefore The car will take 2 h if it travels at a speed of 45 km/h.

(iv)

Solution: Let Rs x be the cost of 5 oranges.

No. of oranges	8	5
Cost of oranges	20.80	x

Clearly, less number of oranges will cost less.

So, it is a case of direct variation.

$$\text{Now, } \frac{8}{20.80} = \frac{5}{x}$$

$$x = \frac{5 \times 20.80}{8}$$

$$x = 13$$

\therefore The cost of 5 oranges is Rs 13.

(v)

Solution: Let x be the number of sheets that weigh 500 g.

No. of sheets	12	x
Weight(in grams)	50	500

More number of sheets will weigh more.

So, it is a case of direct variation.

$$\text{Now, } \frac{12}{50} = \frac{x}{500}$$

$$x = \frac{12 \times 500}{50}$$

$$x = 120$$

\therefore 120 sheets will weigh 500 g.