8th Direct and Indirect Solved Test Paper-1

1. 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, …. = k

(iii) If u = 3v, then u and v vary … with each other.

Solution: (i) Directly

(ii) x and y are said to vary directly with each other if $\frac{x}{y}$ =k, where k is a positive number

(iii) Because u = 3v => $\frac{u}{v}$ = 3 , here 3 is a constant quantity So, u and v vary directly with each other

2. Complete the following tables given that x varies directly as y.

x	4	9	b	c	3	e
y	16	a	48	36	d	4

x varies directly as y => $\frac{x}{y} = k = \frac{4}{16} = \frac{1}{4}$

Case – 1 : $\frac{1}{4} = \frac{9}{a} => a = 9\ x\ 4 = 36$

Case – 2 : $\frac{1}{4} = \frac{b}{48} => b = \frac{48}{4} = 12$

Case – 3 : $\frac{1}{4} = \frac{c}{36} => b = \frac{36}{4} = 9$

Case – 4 : $\frac{1}{4} = \frac{3}{d} => d = 3\ x\ 4 = 12$

Case – 5 : $\frac{1}{4} = \frac{e}{4} => 4 = \frac{4}{4} = 1$

3. 68 boxes of contain commodity require a shelf- length of 13.6 m. How many boxes of the same commodity would occupy a shelf- length of 20.4m?

Solution:

More length of self (x) more box (y) direct variation a/b = c/d

$\frac{X_1}{y1} = \frac{x2}{y2} => \frac{13.6}{68} = \frac{20.4}{y}$

$=> y = \frac{20.4 \times 68}{13.6} = 104\ boxes$

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

Solution: more length of trench more man required (direct variation) a/b = c/d

$\frac{X_1}{y1} = \frac{x2}{y2} => \frac{11}{\frac{27}{4}} = \frac{x}{27}$

$=> \frac{44}{27} = \frac{x}{27} => x = 44$

Therefore, 44 men are required to dig a trench of 27 m.

5. **120 men** had food provisions for 200 days. After 5 days, **30 men die** due to an epidemic. How long will the remaining food last?

Solution:

Man(x)	120	120 -30=90
Day food last(y)	200 - 5=195	y

Less man more days food last (indirect variation) ab = cd

$so,\ 120\ x\ 195 = 90 \times x => x = \frac{120 \times 195}{90}$ = 260 days

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

Solution: less time more speed (indirect variation) => ab = cd

$10\ x\ 48 = c\ x\ 8 => c = \frac{10\ x\ 48}{8} = 60\ km/h$

7. 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?

Solution: more girl less days food last (indirect variation) => ab = cd

$50\ x\ 40 = 80\ x\ d$ => d = $\frac{50\ x\ 40}{80}$ = 25 days

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

Solution: More wages more days work (direct variation) => $\frac{a}{b} = \frac{c}{d}$

$\frac{210}{6} = \frac{875}{d}$ => d = $\frac{875\ x\ 6}{210}$ = 25 days

9. A train 400m long is running at a speed of 72km/hr. How much time does it take to cross a telegraph post?

Solution: Distance cover by train to cross a telegraph post = length of train = 400m

Speed = 72km/h= $\frac{72000m}{3600sec} = 20m/sec$

Time = $\frac{distance}{speed} = \frac{400}{20} = 20\ sec$

10. A train 360m long is running at a speed of 45 km/hr. What time will it take to cross a 140m long bridge?

Solution: Distance cover by train to cross bridge

= length of train + length of bridge = 360 + 140 = 500m

Speed = 45km/h= $\frac{45000m}{3600\text{sec}} = 12.5m/sec$

Time = $\frac{distance}{speed} = \frac{500}{12.5} = 40\ sec$

11. Length of train is 130 meters and speed of train is 45 km/hour. This train can pass a bridge in 30 seconds, then find the length of the bridge.

Solution: Let the length of bridge is x m

Speed of train = 45km/h= $\frac{45000m}{3600\text{sec}} = 12.5m/sec$

Time = 30 seconds

Distance cover by train to cross bridge

= length of train + length of bridge = 130 + x

We know Speed = distance/time $\frac{130+x}{30} = 12.5$

$=> (130 + x) = 375 => x = 375 - 130 = 245$ meters

12. A train 210m long took 12 seconds to pass a 90 m long tunnel. Find the speed of the train.

Solution:

Solution: Distance cover by train to cross bridge

= length of train + length of bridge = 210 + 90 = 300 m , time = 12 sec

$speed = \frac{distance}{\text{Time}} = \frac{300}{12} = 25m/sec$

13. If 5 men or 7women can earn Rs 875per day, how much would 10men and 5women earn per day.

Solution: 5 men = **7 women**

=> 10 men = 14 women

=> for 10 men and 5 women = 14 + 5 = **19 women**

More women more earning per day (direct variation) => $\frac{a}{b} = \frac{c}{d}$

$\frac{7}{875} = \frac{14}{d} => d = \frac{14\ x\ 875}{7} = 875\ x\ 2 = RS.1750$

16. The cost of 16 packets of salt, each weighing 900g, is Rs84. Find the cost of 27packets of salt, each weighing 1kg.

Solution: More packets more cost (Direct variation)

Less weight of each packet less cost (Direct variation)

$\underset{w1:w2}{p1:p2} : cost1 : cost2 => \underset{900:1000}{16:27} : 84 : x$

$=> Product\ of\ extream = product\ of\ mean$

$=> 16 \times 900 \times x = 27 \times 1000 \times 84$

$=> x = \frac{27 \times 1000 \times 84}{16 \times 900} = Rs.157.5$

17. 25 Packets of 12 pencils each cost Rs 750. Find the cost of 32 packets of 8 pencils each

Ans: 25 packets of 12 each = 300 pencils for Rs 750

=> Rate of pencil= Rs 750/300=Rs 2.5/pencil

32 packets of 8 each 8(32)= 256 pencils

Cost of 256 pencils = (256 x 2.5) = Rs 640

So, 32 packets of 8 pencils each would cost Rs 640

18. If 3 persons can weave 168 shawls in 14days, how many shawls will be woven by 8 persons in 5 days?

Solution: More person more shawls weaved (direct variation)

Less days less less shawls weaved (direct variation)

$\underset{Days \quad b1:c2}{person\ a1:a2} : c1 : c2(shawl) => \underset{14:5}{3:8} : 168 : x$

$=> Product\ of\ extream = product\ of\ mean$

$=> 3 \times 14 \times x = 5 \times 8 \times 168$

$=> x = \frac{5 \times 8 \times 168}{3 \times 14} = 160$

19. Four examiners can examine a certain number of answer papers in 10 days by working for 5 hours a day. For how many hours in a day would 2 examiners have to work in order to examine twice the number of answer papers in 20 days?

Solution: Let the number of hours per day be x

More days, less hours per day (Indirect)

Less examiners, more hours per day (Indirect)

More answer papers, more hours per day (Direct)

Days	20	:	10		Time
Examiners	02	:	04	::	5 : x

Answer papers 01 : 02

$(20 \times 2 \times 1 \times x) = (10 \times 4 \times 2 \times 5) \Rightarrow x = \frac{(10 \times 4 \times 2 \times 5)}{(20 \times 2 \times 1)} = 10\ hrs$

20. If the cost of transporting 160kg of goods for 125 km is Rs 60. What will be the cost of transporting 200 kg of goods for 400 km?

Solution: More weight more the cost of transporting (Direct) 160 : 200 = 60 : x

More Distance more the cost of transporting (Direct) 125: 400 = 60 : x

$\begin{matrix}160:200\\125:400\end{matrix}:: 60 : x$ => x = $\frac{200 \times 400 \times 60}{160 \times 125} = Rs.240$

21. 6 oxen or 8 cows can graze a field in 28 days. How long would 9 oxen and 2 cows take to graze the same field?

Solution: 6 oxen = 8 **cows** => 3 oxen = 4 cows
=> 9 oxen = 4 x 3 =12 cows
9 oxen and 2 cows = 12 + 2 = **14 cows**
More cows less days taken to graze the same field (Indirect)

Cows	8	14
days	28	x

Cows 28 : 8 (indirect) : : 14 : x $=> x = 8 \times \frac{14}{28} = 4\ days$

22. 6 men working 8 hours a day, earn Rs. 8400per week. What will be the earning per week of 9 men who work for 6 hours a day?

Solution: $\begin{matrix}(Direct\ variation)\\(Direct\ variation)\end{matrix}$ $\begin{matrix}\text{Men } 6:9\\\text{Hrs a day } 10:6\end{matrix}$ :: 1200 : x (Earning)

$x = \frac{9 \times 6 \times 1200}{6 \times 10} = Rs.620$

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

Solution: Less man more days food last ($Inirect\ variation$)

$=> inverse\ ratio\ of\ man = ratio\ of\ days$

$=> (300 - 50) : 300 = (90 - 20) : x => 250 : 300 = 70 : x => x = \frac{70 \times 300}{250}$ = 84 days

24. 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 for an extra 32 days. How many soldiers left the fort?

Ans : 1200 soldiers - 24 days (after 4 days) then x soldiers - 32 days

More days food (x) last if there will be less solders(y) (indirect)

$X_1 \text{ x } y_1 = x_2\ y_2 => 24\ x\ 1200 = 32 \times x = x = \frac{24 \times 1200}{32} = 900$

$$Soldiers\ left = (1200 - 900) = 300\ soldiers$$

Link: https://jsuniltutorial.weebly.com/study-zone/8thviii-direct-and-inverse-proportion