

Mixtures

$M = \frac{3}{4} \times 120 = 90$   
 $24\% \times 120 = 24$

M	W	Total
90	30	120
<u>Sold</u>		
(18)	6	(24)
72	24	
+ x=16	x=16	

1. In 120 liters of a mixture of milk and water in the ratio of 3:1. If a milkman sold 20% of the mixture and added some equal amount of milk and water into the remaining mixture, the ratio of milk and water becomes 11:5 and then find the difference between the amount of milk and water in the final mixture?

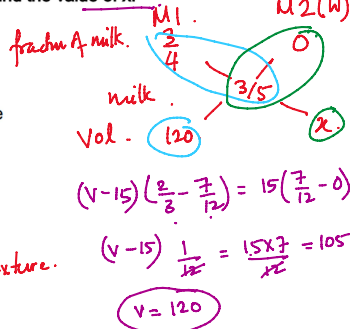
- A. 60 liters
- B. 36 liters
- C. 48 liters
- D. 72 liters
- E. None of these

M:W = 2:1  
 $M = \frac{2}{3} \times W = \frac{2}{3} \times 120 = 80$

2. A vessel contains milk and water in the ratio of 2:1. If 15 liters of mixture is taken out and replaced with water, then the ratio of milk and water becomes 7:5, then find the total quantity of mixture initially?

- A. 90 liters
- B. 120 liters
- C. 60 liters
- D. 150 liters
- E. None of these

3. A vessel contains 160 liters of mixture of milk and water, in which the quantity of milk is 200% more than the quantity of water and 40 liters of mixture is removed and x liters of water is added, then the ratio of the milk to water becomes 3:2. Find the value of x.



$\frac{72+x}{24+x} = \frac{11}{5}$   
 $360 + 5x = 264 + 44x$   
 $6x = 96$   
 $x = 16$

$120 \left( \frac{3}{4} - \frac{3}{5} \right) = x \left( \frac{3}{2} - 0 \right)$   
 $30 \times \frac{3}{20} \times \frac{1}{5} = \frac{3x}{2}$   
 $x = 30$

Time & work

Work = No of people x no of days

Total Work (W) = (A+B) x 20 = (B+C) x 60 = C x 120 = (A+C) x N

1) A and B together can complete the work in 20 days and B and C together can complete the work in 60 days and C alone complete the work in 120 days. In how many days A and C together can complete the work?

- A. 20 days
- B. 24 days
- C. 30 days
- D. 36 days
- E. None of these

A = 300% C = 3C  
 D = 75% C = 3/4 C

2) The efficiency of A is 200% more than the efficiency of C and the efficiency of D is 25% less than the efficiency of C. If A and B together can complete the work in 14 days and C and D together can complete the work in 36 days, in how many days B alone complete the work?

- A. 42 days
- B. 45 days
- C. 48 days
- D. 40 days
- E. 39 days

3) A and B together can complete the three-fourth of the work in 9 days. B and C together can complete two-third of the work in 11(3/7) days and A and C together can complete 75% of the work in 10 days. In how many days A alone complete the work?

- A. 12 days
- B. 24 days
- C. 20 days
- D. 16 days
- E. None of these

75% W → 10 days  
 W → 10/75 days  
 $= \frac{10}{3} \times 4 = \frac{40}{3}$  days

$\frac{3}{4} W \rightarrow 9$  days  
 $W \rightarrow \frac{9}{3/4} = 12$  days  
 $\frac{2}{3} W \rightarrow 11 \frac{3}{7}$  days  
 $W \rightarrow \frac{11 \frac{3}{7}}{2/3} = \frac{11 \times 3}{2} = \frac{33}{2}$  days

$N = (A+B)14 = (C+D)36 = B \times N$   
 $N = (3C+B)14 = (C+\frac{3}{4}C) \times 36 = B \times N$

$(3C+B) \frac{14}{4} = \frac{3}{4} \times 36$   
 $6C + 2B = 9C$   
 $2B = 3C$

$B = \frac{3}{2} C$

$W = \frac{3}{4} \times 36C = 63C$   
 $63C = B \times N = \frac{3}{2} C \times N$   
 $N = 42$

$W = (A+B)12 = (B+C)120 = (A+C) \times 40$   
 $\frac{1}{2}(A+B) = \frac{10}{3}(B+C)$   
 $3A + 3B = 10B + 10C$   
 $3B + 10C = 3A$

$3B + 10C = 3A$  (1)  
 $4C + 10C = 7A$   
 $14C = 7A$   
 $C = A/2$

$W = (A + \frac{2}{3}A) \times 12 = A \times N$

$\frac{5}{3} \times 12A = A \times N$   
 $N = 20$

$9B + 2C = 3B + 10C$   
 $6B = 8C$   
 $B = \frac{4}{3}C$

$\frac{3}{7}(B+C) = \frac{40}{3}(A+C)$   
 $9B + 9C = 7A + 7C$   
 $9B + 2C = 7A$

$14C = 7A$   
 $C = A/2$

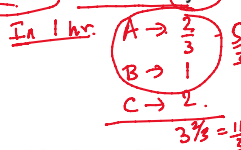
$B = \frac{4}{3} \times \frac{A}{2} = \frac{2}{3}A$

$C \rightarrow \frac{1}{2} \text{ hr}$   
 $A \rightarrow 1 \frac{1}{2} \text{ hr} = \frac{3}{2} \text{ hrs}$

Pipes & cisterns

1) Pipe A alone can fill the tank in 1 hour 30 minutes and pipe B alone can fill the tank in 1 hour and pipe C alone can fill the tank in 30 minutes. Pipes A, B and C opened together. After y minutes, pipe C closed and the remaining tank is filled by pipe A and B together in 25 minutes. Find the value of y?

- A. 5
- B. 8
- C. 12
- D. 15
- E. None of these



2) Pipe P and Q are inlet pipes and Pipe R is an outlet pipe. The time taken by Pipe P, Q and R together to fill the tank is equal to the time taken by Pipe P alone to fill the tank. If the time taken by Pipe P alone can fill the tank is 12.5% → 5m.

$12.5\% = \frac{1}{8} \rightarrow 5m$

3/4<sup>th</sup> of the time taken by Pipe Q alone to fill the tank. Pipe R can empty it in 60 minutes, find the time taken by Pipe P to fill the tank.

- A. 45 minutes
- B. 40 minutes
- C. 60 minutes
- D. 30 minutes
- E. None of these

$A+B \rightarrow \frac{3}{5} \text{ hr} = \frac{3}{5} \times 60 = 36 \text{ min}$   
 $\frac{3}{11} \text{ hr} = \frac{3}{11} \times 60 = \frac{180}{11} \text{ min}$   
 $1 \text{ m} \rightarrow \frac{1}{30} \text{ of the tank}$   
 $25 \text{ m} \rightarrow \frac{25}{30} = \frac{5}{6}$

3) Pipes P and Q together can fill the tank in 24 minutes and pipes Q and R together can fill the tank in 30 minutes and pipe Q alone can fill 12.5% of the tank in 5 minutes. Find the time taken by pipes P and R together to fill the tank?

- A. 30 minutes
- B. 40 minutes
- C. 15 minutes

D. 60 min  
 E. None of these

T. 1 min R → 1/2 of the tank

fraction of work done in 1 hr or unit time.

Together A+B+C takes

$\frac{1}{180} = 1 - \frac{25}{36}$   
 $\frac{11}{180} = \frac{11}{180}$   
 $\frac{11}{180} = 1 - \frac{25}{36} = \frac{11}{36}$   
 $y = \frac{180}{36} = 5$

and R together to fill the tank is equal to the time taken by Pipe P alone to fill the tank. If the time taken by Pipe P alone can fill the tank is

12.5% =  $\frac{1}{8}$  → 5 m.  
full → 40 m.



$Q = \frac{1}{40}$   
 $P+Q = \frac{1}{24}$   
 $Q+R = \frac{1}{30}$

$P = \frac{1}{24} - \frac{1}{40} = \frac{2}{120} = \frac{1}{60}$   
 $R = \frac{1}{30} - \frac{1}{40} = \frac{1}{120}$

$P+R \rightarrow \frac{1}{60} + \frac{1}{120} = \frac{2}{120} = \frac{1}{60}$

$\frac{3}{4T} = \frac{1}{60}$   
 $T = \frac{3}{4} \times 60 = 45 \text{ min}$

- A. 30 minutes
- B. 40 minutes
- C. 15 minutes

D. 60 min  
E. None of these

$\frac{11y}{180} = 1 - \frac{2y}{30} = \frac{11}{30}$   
 $y = \frac{180}{36} = 5$

In 1 min  
R →  $\frac{1}{60}$  of the tank.  
P →  $\frac{1}{60}$  " " "  
Q →  $\frac{3}{4T}$  " " "

$P+Q-R = T$

$\frac{1}{60} + \frac{3}{4T} - \frac{1}{60} = \frac{1}{T}$

$T = \frac{3}{4} \times 60 = 45 \text{ min}$

Ratio & proportion

1. In an examination of bank, the number of passed candidates was five times the number of failed candidates. If there had been 40 less candidates appeared and 20 more candidates had failed, then the ratio of passed to failed candidates becomes 3:1. Then find the total number of candidates failed initially.

- A. 70
- B. 60
- C. 50
- D. 300
- E. None of these

2. The ratio of the number of literate and illiterate population in the city is 8:5. If 40% of the illiterate population are female and the number of literate male population in the city is 9600 and the number of literate population is

$8x - 5x = 8400$   
 $3x = 8400$   
 $x = 2800$

L		
M	F	Total
9600	12800	22400

$224$   
 $-96$   
 $128$

Ill

M	F	Total
3x	2x	5x
	5600	

Total

M	F	Total
		13x

$A = 600$

8400 more than the number of illiterate population, then find the number of female population in the city?

- A. 18200
- B. 18400
- C. 18600
- D. 18800
- E. 18900

3. The total population of town A is  $\frac{2}{5}$ th of the total population of town B and the ratio of the total population of town A to C is 4:7. If the total population of towns A and C together is 150 more than that of town B, then find the total population of town C?

- A. 700
- B. 1400
- C. 1050

D. 840  
E. None of these

P	F	Total
$5x$	$2x$	$6x$
$5x - 60$	$x + 20$	$6x - 40$
$\frac{5x - 60}{x + 20} = 3$		
$5x - 60 = 3x + 60$		
$2x = 120$		
$x = 60$		

$A = \frac{2}{5}B$      $A = \frac{4}{7}C$   
 $B = \frac{5}{2}A$      $C = \frac{7}{4}A$

$A + C = B + 150$   
 $A + \frac{7}{4}A = \frac{5}{2}A + 150$   
 $\frac{11}{4}A - \frac{5}{2}A = 150$   
 $\frac{11}{4}A - \frac{10}{4}A = 150$   
 $\frac{1}{4}A = 150$   
 $A = 600$

Direction (1-10): The following question contains two equations as I and II. You have to solve both equations and determine the relationship between them and give the answer as,

- 1)  
I)  $x^2 + x - 702 = 0$   
II)  $y^2 + 57y + 812 = 0$

- A.  $x > y$
- B.  $x \geq y$
- C.  $x = y$  or relationship can't be determined.
- D.  $x < y$
- E.  $x \leq y$

- 2)  
I)  $x^2 - 70x + 1225 = 0$   
II)  $y^2 - 69y + 1190 = 0$   
A.  $x > y$

- B.  $x \geq y$
- C.  $x = y$  or relationship can't be determined.
- D.  $x < y$
- E.  $x \leq y$

- 3)  
I)  $x^2 - 10x + 24 = 0$   
II)  $2y^2 - 13y - 21 = 0$
- A.  $x > y$
  - B.  $x \geq y$
  - C.  $x = y$  or relationship can't be determined.
  - D.  $x < y$
  - E.  $x \leq y$

1. If the ratio of the side of the cube to side of the square is 1:2 and the ratio of the length of the rectangle to breadth of the rectangle is 5:4 and the area of the rectangle is  $80\text{cm}^2$ . If the perimeter of the rectangle is equal to the area of the square, then find the volume of the cube?

- A.  $64\text{cm}^3$
- B.  $8\text{cm}^3$
- C.  $25\text{cm}^3$
- D.  $27\text{cm}^3$
- E. None of these

2. The ratio of the radius of the cylinder and radius of the sphere is 1:2 and the height of the cylinder is 14cm. If the curved surface area of the cylinder is  $616\text{cm}^2$ , then what is the difference between the numerical value of volume of the cylinder and the surface area of the sphere?

- A. 308
- B. 402
- C. 317
- D. 423
- E. None of these

3. If the length of the cuboid is increased by 30%, height of the cuboid is increased by 10% and the breadth of the cuboid is decreased by 40%. Then find how much % does the volume will be increased or decreased by?

- A. 14.2% increased
- B. 12.5% decreased
- C. 8.2% increased
- D. 13.6% decreased
- E. None of these

4. The circumference of a circle is one-third of the perimeter of a rectangle. The area of the circle is  $2464\text{ sq. m}$ . What is the area of the rectangle, if the breadth of the rectangle is 120 m?

- A.  $18560\text{ sq. m}$
- B.  $17280\text{ sq. m}$
- C.  $16720\text{ sq. m}$
- D.  $19340\text{ sq. m}$
- E. None of these