

Solutions by Dev Anoop

(17) Inlet / outlet

Time to fill tank (in min)

work done in 1 min

A	B	C	A+B+C
12	15	10	x
$\frac{1}{12}$	$\frac{1}{15}$	$\frac{1}{10}$	$\frac{1}{x}$

$$\frac{1}{x} = \frac{1}{12} + \frac{1}{15} - \frac{1}{10}$$

$$= \frac{5 + 4 - 6}{60}$$

$$= \frac{3}{60} = \frac{1}{20}$$

$$\Rightarrow x = 20$$

(18) Pipe / leak

Time to fill / empty tank (in h)

work done in 1 h

A	B	A+B
9	10	x
$\frac{1}{9}$	$\frac{1}{10}$	$\frac{1}{x}$

$$\frac{1}{x} = \frac{1}{9} - \frac{1}{10}$$

$$\Rightarrow \frac{1}{x} = \frac{10 - 9}{90}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{90}$$

$$\Rightarrow x = 90$$

(19) Pipe/s

Time to fill tank (in h)

work done in 1 h

A	B	A+B
6	8	x
$\frac{1}{6}$	$\frac{1}{8}$	$\frac{1}{x}$

$$\frac{1}{x} = \frac{1}{6} + \frac{1}{8}$$

$$= \frac{4+3}{24}$$

$$\frac{1}{x} = \frac{7}{24}$$

work done in 2 h = $2 \times \frac{7}{24} = \frac{7}{12}$

work left = $1 - \frac{7}{12} = \frac{5}{12}$

Time taken by B for 1 work = 8 h

Time taken by B for $\frac{5}{12}$ work = $8 \times \frac{5}{12} = 3\frac{1}{3}$