

1

To complete the job  $6 \times 10 = 60$  man/hours are needed. By 5:00 PM  $6 \times 6 = 36$  man/hour done. 24 is left.

5:00 PM - 6:00 PM 7 man/hour;  
6:00 PM - 7:00 PM 8 man/hour;  
7:00 PM - 8:00 PM 9 man/hour.

$$7+8+9=24.$$

Answer: C.

2

In three minutes net gain is  $40+30-20=50$  liters;

After 13 cycles ( $13 \times 3 = 39$  minutes) net gain will be  $13 \times 50 = 650$  liters.

Then in 1 minute pipe A will add 40 liters, 10 liters to be filled;

Then to fill 10 liters pipe B will need  $10/30 = 1/3$  min.

So total time  $39 + 1 + \frac{1}{3} = 40\frac{1}{3}$  min.

3

I think you did everything right.

Let the time needed for A, B and C working individually to process 6,000 envelopes be  $a$ ,  $b$  and  $c$  respectively.

Now, as "A can process 6,000 envelopes in 3 hours" then  $a = 3$ ;

As "B and C working together but independently can process the same number (6,000) of envelopes in 2.5 hours" then  $\frac{1}{b} + \frac{1}{c} = \frac{1}{2.5} = \frac{2}{5}$ ;

Also, as "A and C working together but independently process 3000 envelopes in 1 hour", then A and C working together but independently process  $2 \times 3,000 = 6,000$  envelopes in  $2 \times 1 = 2$  hours:  $\frac{1}{a} + \frac{1}{c} = \frac{1}{2} \rightarrow$  as  $a = 3$  then  $c = 6$ ;

So,  $\frac{1}{b} + \frac{1}{6} = \frac{2}{5} \rightarrow b = \frac{30}{7}$ , which means that B produces 6,000 envelopes in  $30/7$  hours, thus it produces 12,000 envelopes in  $60/7$  hours.

Answer: E.

4

Machine A needs 12 days \* 2 shifts = 24 shifts to do the whole job;

Machine B needs 15 days \* 2 shifts = 30 shifts to do the whole job;

In one day each machine works 1.5 shifts ( $3/2$  shifts), doing  $(3/2)/24 + (3/2)/30 = 9/80$  th of the whole job in one day, thus with the current work schedule they'll need  $80/9 = 9$  days.

Answer: D.

5

As pool is filled to  $3/5$  of its capacity then  $2/5$  of its capacity is left to fill.

To fill  $3/5$  of the pool took 8 hours  $\rightarrow$  to fill  $2/5$  of the pool will take  $8/(3/5) \times 2/5 = 16/3$  hours = 5 hours 20 minutes (because if  $t$  is the time needed to fill the pool then  $t \times 3/5 = 8 \rightarrow t = 8 \times 5/3$  hours  $\rightarrow$  to fill  $2/5$  of the pool  $8 \times 5/3 \times 2/5 = 16/3$  hours will be needed).

Or plug values: take the capacity of the pool to be 5 liters  $\rightarrow 3/5$  of the pool or 3 liters is filled in 8 hours, which gives the rate of  $3/8$  liters per hour  $\rightarrow$  remaining 2 liters will require: time = job/rate =  $2/(3/8) = 16/3$  hours = 5 hours 20 minutes.

Answer: B.