# Solutions – Difficult Test

١. (b) : When S١ runs ١٩٠٠ metres, S٢ would run ١٨٦٢ metres. Hence, the start given is

$\frac{٣٨}{١٩٠٠} \times ٢٠٠٠ = ٤٠$ metres.

٢. (c) : Suppose the hound catches the rabbit in t minutes

Number of jumps by the rabbit = ٣٥t & distance covered = ٢٠ × ٣٥t = ٧٠٠t cm.

Similarly Distance covered by hound = ٢٥t × ٦٠ = ١٥٠٠t cm.

Now, ١٥٠٠ t – ٧٠٠t = ٧٠٠٠ cm or t = $\frac{٣٥}{٤}$ min.

٣. (c) : Let there be x litres of wine in the beginning

$\left(\frac{x-8}{x}\right)^{٢} = \frac{٨١}{١٠٠}$

⇒x = ٨٠ litres

٤. (c) : Let A = abc and B = cba

Therefore, B – A = ١٠٠c + ١٠b + a – (١٠٠a + ١٠b + c) = ٩٩(c – a). B – A is a multiple of ٧.

Therefore, c – a = ٧ (a, c) (١, ٨) or (٢, ٩).

Hence, number is between ١٠٨ to ١٩٨ or ٢٠٩ to ٢٩٩.

٥. (a) : Total S.P. will be

٨ ´ ٢.٣٦ + $\frac{x}{١٠٠}$ ١٦ [x + ١]١٢٠ = ١٨.٨٨x + ٤.٨x + ١٩.٢

C.P. = [$\frac{x}{٨}$] ٢١٦ = ٢٧x

Profit = ٢٣.٦٨x + ١٩.٢ — ٢٧x = ١٩.٢ – ٣.٣٢x

٦. (d)

Px = (P – ٠.٢)(x + ١٠٠) = (P + ٠.٣)(x – ١٢٠)

Solving x = ١٠٠٠

٧. (b) : Volume of smaller cone

= $\frac{١}{٣}$ p(٣)٢ ´ ٩ = ٢٧p

Volume of large cone = $\frac{١}{٣}$ p(٥)٢ ´١٥ = ١٢٥p

⇒Volume of the solid = ١٢٥π – ٢٧π = ٩٨π

٨. (c) : Let the speed of A be x km/hr and speed of B be y km/hr, then:

$\frac{٥٥}{x} = \frac{٥٥}{y} - \frac{١}{٢}$ .....(١)

Also, $\frac{٥٥}{x} = \frac{٥١}{y} - \frac{١}{١٠}$ .....(٢)

On solving both equation (١) & (٢) we get x = ١١ km/hr and y = ١٠ km/hr.

٩. (a) : Let the distance be x km and speed be y km/hr and t be the time in hours. Then the equation will be x = yt ... . . (١)،

Therefore، $\frac{٥٠}{y} + \frac{[x - ٥٠]}{٣y/٥} = t+3$ . . . . .(٢)

Also، $\frac{١٠٠}{y} + \frac{x - ١٠٠}{٣y/٥} = t + 2$ . . . . . (٣)

On solving the above equations، we get speed is $\frac{١٠٠}{٣}$ km/hr time is ٦ hrs، and distance is ٢٠٠ km.

١٠. (b) :

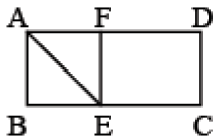
| I | II | III |
|---|---|---|
| ٢:٥ | ٣ : ٤ | ٤ : ٥ |
| | | |

Hence new ratio

$$\frac{\left(\frac{٢}{٧} + \frac{٣}{٧} + \frac{٤}{٩}\right)}{\left(\frac{٥}{٧} + \frac{٤}{٧} + \frac{٥}{٩}\right)}$$

= ٧٣ : ١١٦

١١. (d) :




Area of Δ ABE = ٧ cm٢
Area of ABEF = ١٤ cm٢
Area of ABCD = ١٤ × ٤ = ٥٦ cm٢
(As CE = ٣ × BE) = ٥٦ cm٢

١٢.(a) : Let oil in containers be A & B.
After ١st operation
Container A = ٠.٤ A
Container B = ٠.٦ A + B
After ٢nd operation
Container A = ٠.٤ A + ٠.٣ A + ٠.٥ B
Container B = ٠.٣ A + ٠.٥ B

$= \frac{(٠.٧A+٠.٥B)}{١١} = \frac{(٠.٣A+٠.٥B)}{٧}$

١.٦A = ٢B Þ $\frac{A}{٥} = \frac{B}{٤}$

Volume of A : B = ٥ : ٤.

١٣. (b) : Let n = the number of terms.

Then، $\frac{٢٥٧}{١٦} = \frac{n}{٢}\left[١٧ + \left(-\frac{١٢٣}{٨}\right)\right] = \frac{n}{٢} \times \frac{٤٥}{٨}$

$\Rightarrow \frac{٤٠٧}{١٦} = ٣٧ \Rightarrow n = \frac{٤٠٧}{١٦} = \frac{٤٠٧}{٣٧} = ١١$

Let d be the common difference.

Then $-\frac{١٢٣}{٨}$ (= the eleventhterm) = ١٧ + ١٠d

$\Rightarrow 10 = -d \quad \frac{١٢٣}{٨} - ١٧ = -\frac{٢٣٥}{٨}$

$\Rightarrow d = -\frac{٢٣٥}{٨ \times ١٠} = -\frac{٤٧}{١٦}$

١٤. (d) : Since M is the midpoint of side PQ، the length of MQ is ٢.

Hence، the area of $\Delta$MQR = $\frac{١}{٢}$ × ٢ × ٤ = ٤.

Also area of $\Delta$ NSR = ٤. Thus، the unshaded area of the figure = ٤ + ٤ = ٨.

Hence، the area of quadrilateral PMRN

= Area of the square PQRS – The unshaded area of the figure

= ١٦ − ٨ = ٨

١٥. (b) : Let speeds of P، Q & R be P، Q & R km/hr respectively.

Thus ٤P = ٢R

= $\frac{P}{R} = \frac{1}{٢}$ . . . . . (١)

= ٥Q = ٤R = $\frac{Q}{R} = \frac{4}{٥}$ . . . . . (٢)

From (١) & (٢)،

= $\frac{P/R}{Q/R} = \frac{١/٢}{٤/٥}$

= $\frac{P}{Q} = \frac{٥}{٨}$

١٦. (a) : We have (A − ٢٠) = ٠.٤ (B + ٢٠)، i.e. A − ٠.٤B = ٢٨

And (B − ٤٠) = ٠.٤(A + ٤٠)، i.e. B − ٠.٤A = ٥٦

Solving we get، A = Rs. ٦٠

١٧. (a) : Given quadratic equation x٢ + ax + b = ٠

Then product of roots αβ = b

Sum of roots α + β = − a

Next quadratic equation bx٢ + ax + ١ = ٠

Then product of roots = $\frac{١}{b} = \frac{١}{\alpha\beta}$

Hence، clearly by visualising options

New roots we will be $\frac{١}{\alpha}$ and $\frac{١}{\beta}$

١٨. (b) : Average salary of each temporary employee is ٦٠٠.

١٠٠٠ temporary employee،
Total salary = ٦،٠٠٠،٠٠٠
let teaching departement = Rs. x / staff and cleaning department salary = x
Now، ٦٠٠ (x + ١٠٠) + ٤٠٠(x) = ٦،٠٠٠،٠٠٠
x=٥٤٠

Hence answer x+١٠٠= ٥٤٠+١٠٠
=٦٤٠

١٩. (c) : ٨١! when divided by ٨٣ leaves a remainder +١ (as ٨٣ is prime) Hence the total remainder is +١ × ٨١ = ٨١.

٢٠. (c) : Let the number of men be ١٠٠.
Then، Men × Time = Work
١٠٠ × ١ = ١٠٠ unit
Amount of work increased by ٥٠٪.
So، New work = ١٥٠ unit
as the planned time remains same i.e. ١
Then men required will be ١٥٠ i.e.، ٥٠ more workers but since new workers are ٢٥٪ more efficient i.e. ٥/٤ times efficient as existing workers.
∴ Actual number of workers = ٥٠ / (٥/٤) = ٤٠ men

∴ Required percent = ٤٠/١٠٠ × ١٠٠ = ٤٠٪