Profit & Loss

CP, SP and MP

Discount

MP → Rs. 2000 → 20% discount → Rs. 400

Overhead

1000 + 200 = 1200

2000 − 400 = 1600

Rs. 1000

CP
↓
Cost price

profit / loss

SP
↓
Selling price

MP
↓
Marked price

SP > CP → profit

SP < CP → loss

20% profit → Rs. 200 → profit

% profit
% loss

Relation

Discount

Profit & Loss

Percentage Profit / Loss:

$\longrightarrow$ profit = (SP − CP)

$\longrightarrow$ loss = (CP − SP)

CP → Rs. 2000 → SP → Rs. 2600 → SP → Rs. 1400

$$\% \text{ profit} = \left(\frac{\text{profit}}{CP} \times 100\right)\%$$

$$= \left(\frac{SP - CP}{CP} \times 100\right)\%$$

$$= \frac{2600 - 2000}{2000} \times 100 = 30\%$$

$$\% \text{ loss} = \left(\frac{\text{loss}}{CP} \times 100\right)\%$$

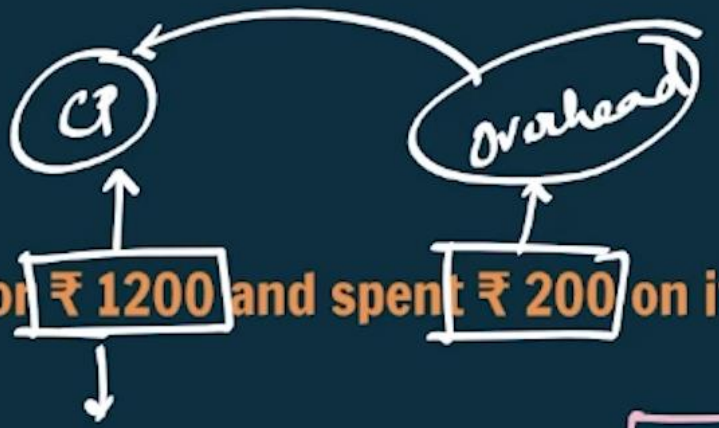
$$= \left(\frac{CP - SP}{CP} \times 100\right)\%$$

$$\frac{1400 - 2000}{2000} \times 100$$

$= -30\%$

loss

Profit & Loss



Q1. A man bought an old typewriter for ₹ 1200 and spent ₹ 200 on its repair. He sold it for ₹ 1680. His profit percent is:

SP

i. 20%

ii. 10%

iii. 8%

iv. 16%

Actual CP = 1200 + 200 = ₹ 1400

$$\% \text{ profit} = \frac{SP - CP}{CP} \times 100$$

$$= \left(\frac{1680 - 1400}{1400} \times 100 \right)$$

$$= \frac{20}{\cancel{280}} = 20\%$$

Profit & Loss

$\frac{1}{11} \rightarrow 9.09\%$

$9\frac{1}{11}\%$

Q2. The ratio of cost price and selling price is 11 : 15. The percent of profit will be:

i. 26%

ii. 36(4/11)%

iii. 12.5%

iv. 10%

$\frac{CP}{SP} = \frac{11}{15}$

36.36%

$36\frac{4}{11}\%$

$\% \text{ profit} = \frac{SP - CP}{CP} \times 100\%$

$= \frac{15-11}{11} \times 100 = \frac{4}{11} \times 100$

Profit & Loss

An interesting approach:

100 + 12.5 → 9/8

1 → 1/8

[Extension of Unitary Method]

CP → 100

SP → 112.5

profit = 12.5

Value

Q3. A Shopkeeper sells an article at 12.5% profit. If SP of an article is Rs. 630, then find the CP of an article.

1/8

i. 700

ii. 560

iii. 500

iv. 600

630 × 100/112.5

Whatever they want you find out!!

630 × 12.5/112.5

70

630 × 8/9

= 560

Whatever the value represents

70 630 × 1/9 = 70

Profit & Loss

Q4. A horse was sold for Rs 80000 at 25% profit. In order to gain 40% profit, at what price it should be sold?

CP → 100
SP → 125

SP → 140

i. 89600
ii. 94400
iii. 90000
iv. 85000

$$80000 \times \frac{140}{125} = 3200 \times 28 \rightarrow 6$$

SP @ 25% profit

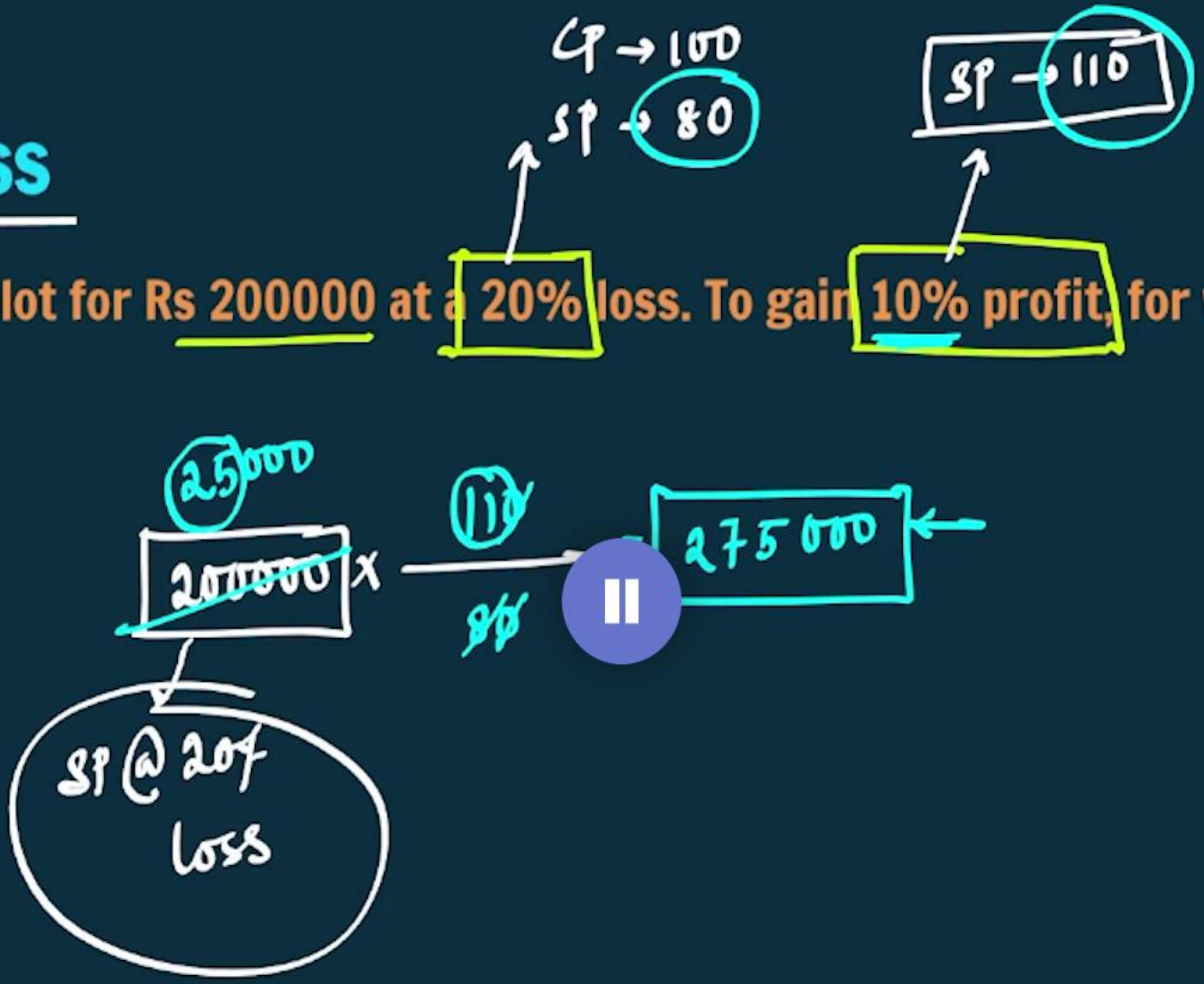
$$32 \times 28 = (30+2)(30-2) = 30^2 - 2^2 = 900 - 4 = 896$$

89600

Profit & Loss

Q5. Mohan sold a plot for Rs 200000 at a 20% loss. To gain 10% profit, for what price should he sell the plot?

i. 250000
ii. 275000
iii. 300000
iv. 225000



Profit & Loss

~~Q~~6. Mahesh purchased a radio at (9/10)th of its selling price and sold it at 8% more than its original selling price. His percentage gain is:

i. 20%
ii. 10%
iii. 8%
iv. 18%

$CP = \frac{9}{10} \times SP$ → SP → 100

Actual SP = 100 + 8 = 108 (SP)

$CP = \frac{9}{10} \times 100 = 90$ (CP)

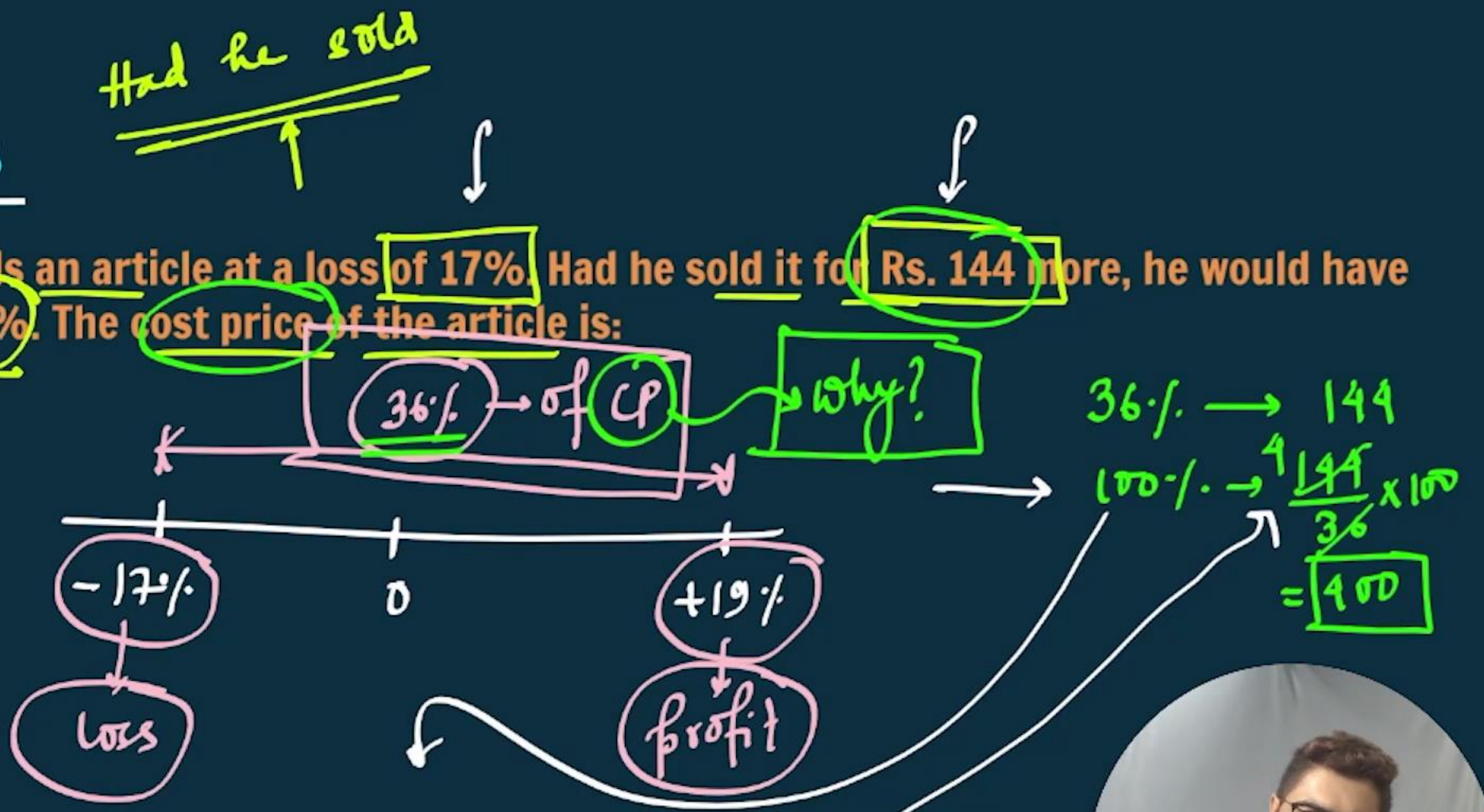
$\% \text{ gain} = \frac{SP - CP}{CP} \times 100$

$10\% = \frac{18}{90} \times 100 = \frac{108 - 90}{90} \times 100$

Profit & Loss

Q7. A shopkeeper sells an article at a loss of 17%. Had he sold it for Rs. 144 more, he would have earned a profit of 19%. The cost price of the article is:

i. Rs. 300
ii. Rs. 250
iii. Rs. 400
iv. Rs. 500



$$36\% \text{ of } CP = 144$$

$$\Rightarrow \frac{36}{100} \times CP = 144 \Rightarrow CP = \frac{144 \times 100}{36}$$

$$= \text{Rs. } 400$$

Profit & Loss

Q8. The CP of 9 articles is equal to the SP of 12 articles. What is the loss percentage?

i. 25%
ii. 35%
iii. 10%
iv. 33.33%

$$9 \times CP = 12 \times SP$$

$$\Rightarrow \frac{CP}{SP} = \frac{4}{3}$$

$SP = 3$

$CP = 4$

$$\% \text{ loss} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{3-4}{4} \times 100 = -25\%$$

Profit & Loss

Q9. After selling 25 lemons, a shopkeeper loses SP of 5 lemons. Find percentage loss of shopkeeper.

i. 10%
ii. 20%
iii. 16.66%
iv. 25%

SP → Rs. 1

SP → Rs. 25

Loss → Rs. 5

% loss = $\frac{5}{30} \times 100$

= 16.66%

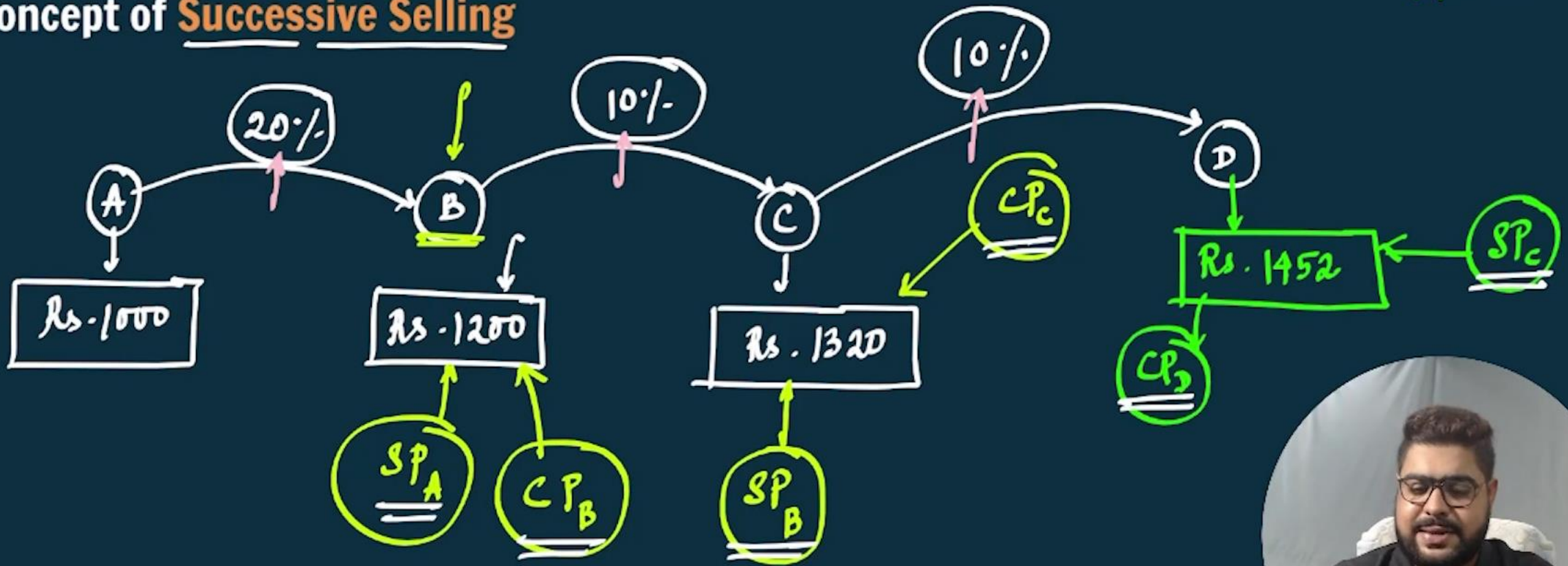
CP → 25 + 5 = Rs. 30

Profit & Loss

Concept of Successive Selling

a – b theorem

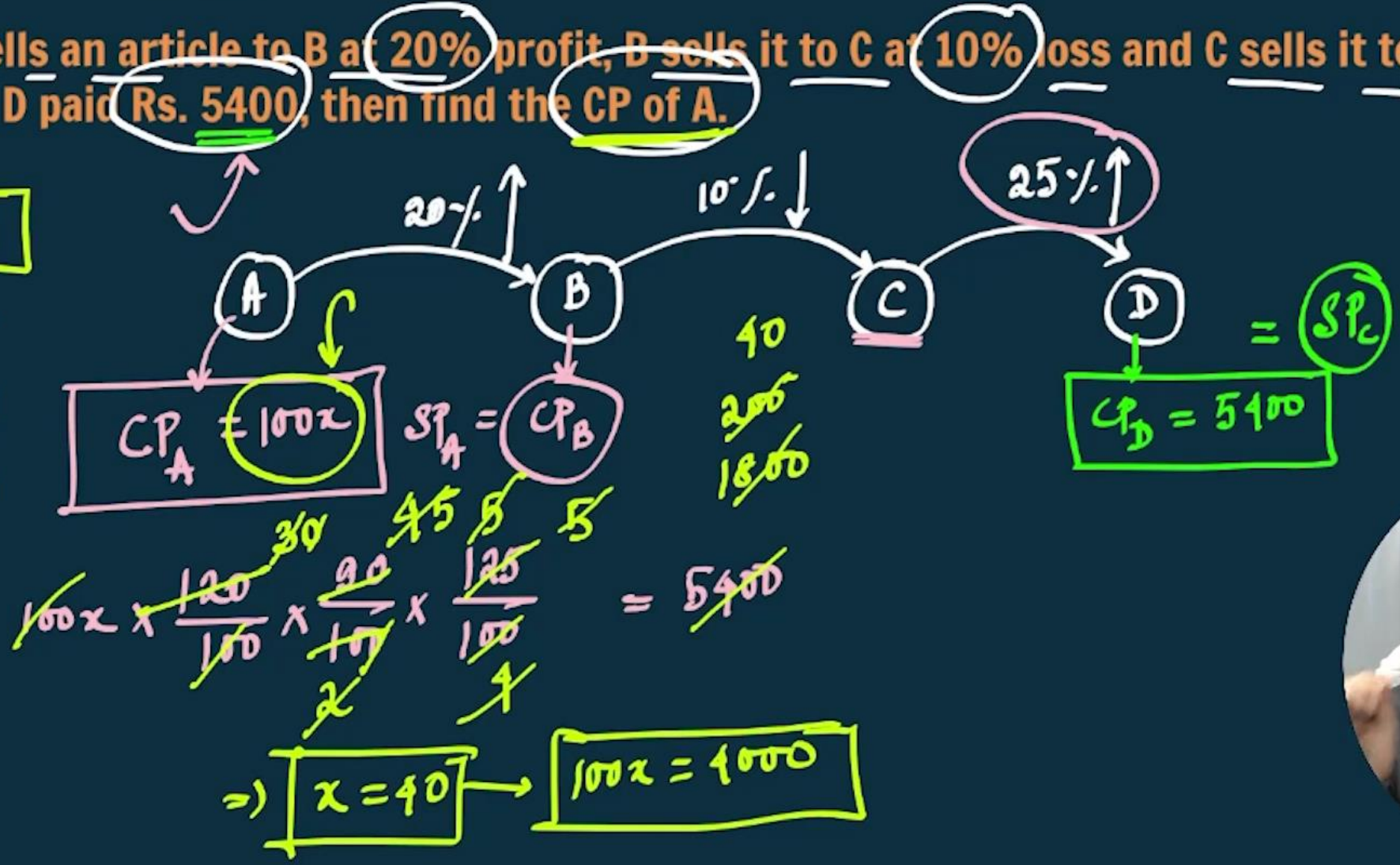
1320
132
1452



Profit & Loss

Q10. A sells an article to B at 20% profit, B sells it to C at 10% loss and C sells it to D at 25% profit. If D paid Rs. 5400, then find the CP of A.

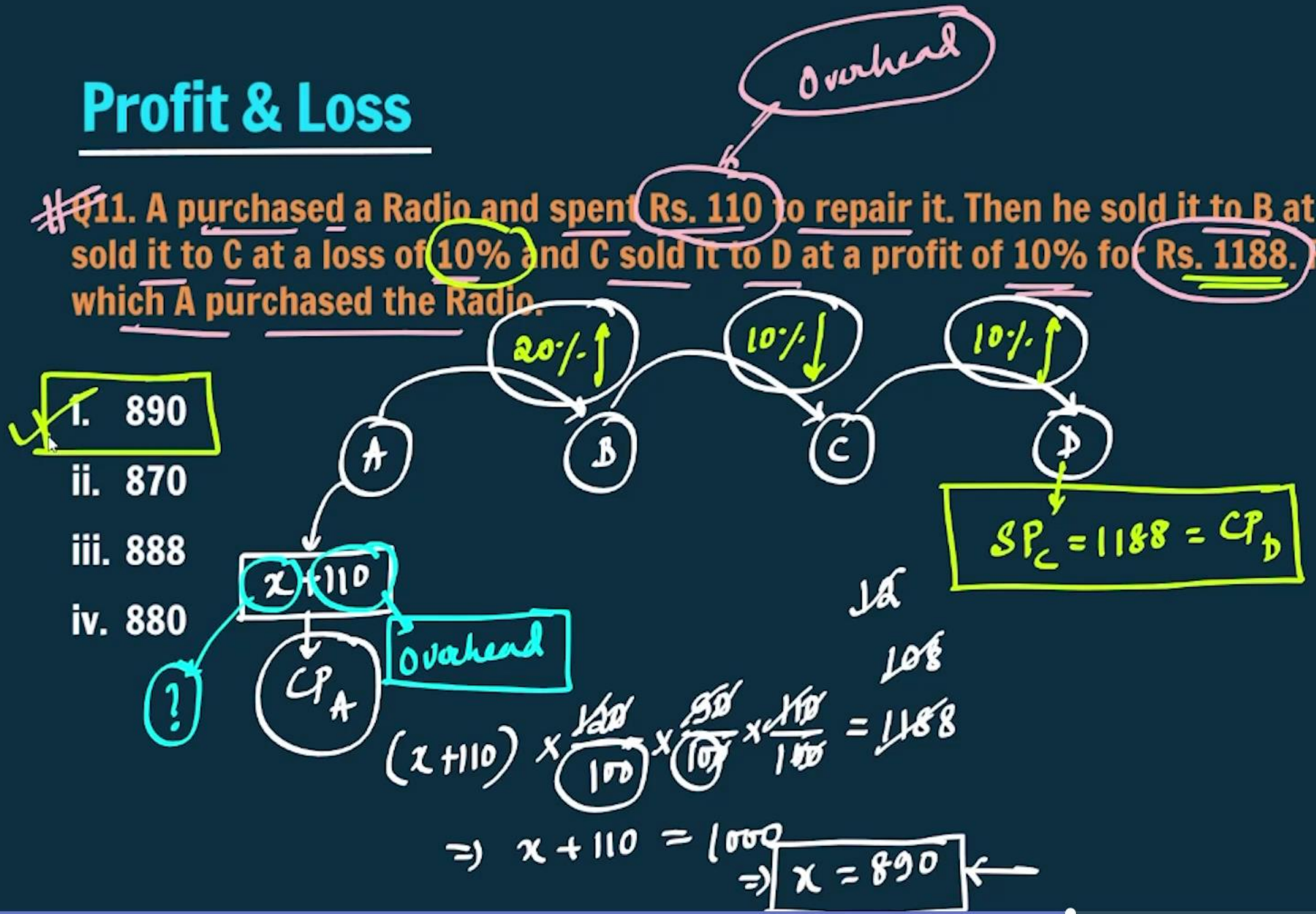
i. 4000
ii. 4100
iii. 3900
iv. 4400



Profit & Loss

#Q11. A purchased a Radio and spent Rs. 110 to repair it. Then he sold it to B at a profit of 20%. B sold it to C at a loss of 10% and C sold it to D at a profit of 10% for Rs. 1188. Find the price at which A purchased the Radio.

i. 890
ii. 870
iii. 888
iv. 880



$a+b+\frac{ab}{100}$ → +20, −10, +10 → $-10+10-\frac{10\times10}{100}=-1\%$

$+20-1-\frac{20\times1}{100}$

$=19-\frac{1}{5}=\frac{94}{5}\%$

Profit & Loss

#Q11. A purchased a Radio and spent Rs. 110 to repair it. Then he sold it to B at a profit of 20%. B sold it to C at a loss of 10% and C sold it to D at a profit of 10% for Rs. 1188. Find the price at which A purchased the Radio.

i. 890
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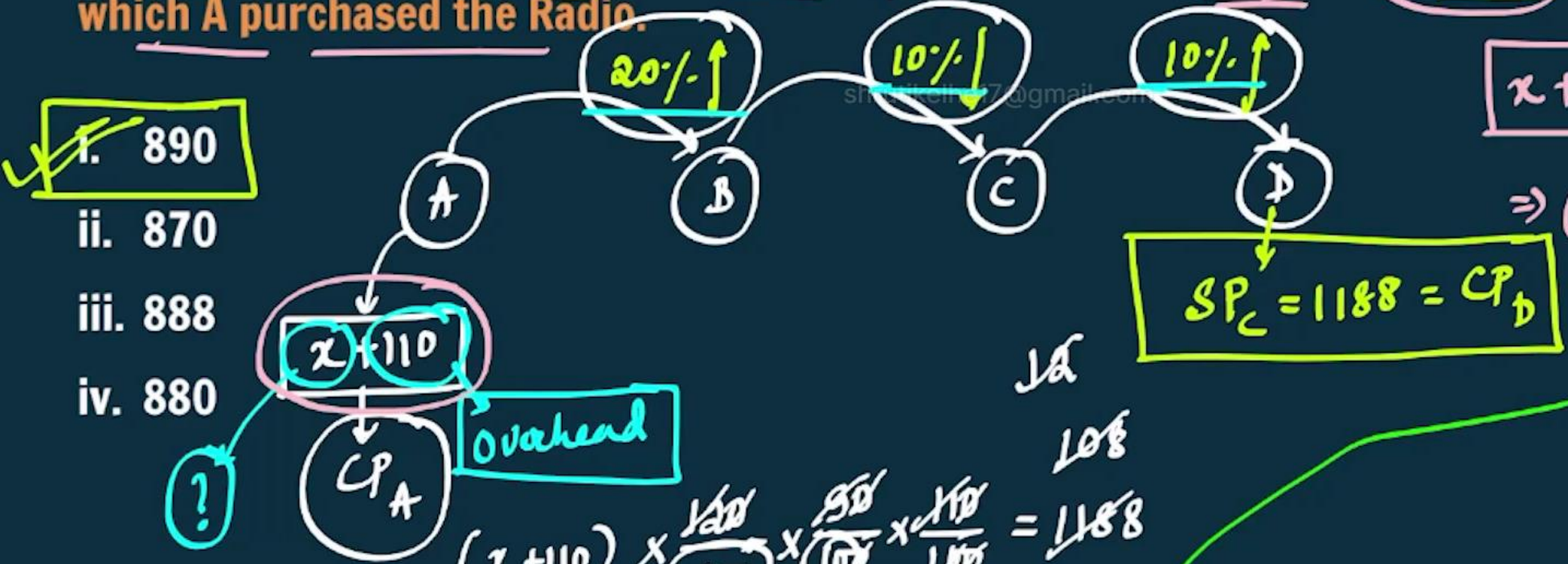


$(x+110)\times\frac{120}{100}\times\frac{90}{100}\times\frac{110}{100}=1188$

$x+110=1000$

$x+110\times\frac{100+\frac{91}{5}}{100}=1188$

$\Rightarrow(x+110)\times\frac{504}{500}=1188$

$\Rightarrow x+110=1000$

Profit & Loss

9 parts → Rs. 450

1 part → Rs. $\frac{450}{9}$ = Rs. 50

7 parts → 7 × 50 = Rs. 350 ← SP

SP = CP + profit

#Q12. Cost price of 14 watches are same and each watch sells for Rs. 450 and as a result, earns a profit equals to cost price of 4 watches. Find the cost price of each watch.

CP = ?

i. 500

ii. 350

iii. 550

iv. 300

CP × 14 → 9 × CP

profit = $\frac{4}{9}$

CP for 14 watches

SP of 14 watches = CP of 18 watches

14 × SP = 18 × CP

$\Rightarrow \frac{CP}{SP} = \frac{7}{9}$

Profit & Loss

#. SP of two items are same → Use a–b theorem

. CP of two items are similar → Use allegation theorem.

#Q13. A shopkeeper sells two TV sets for the same price. He gains 20% on one set and loses 20% on another. What is net loss or gain% in the whole transaction?

i. 2% profit
ii. 2% loss
iii. 4% profit
iv. 4% loss

SP Same

a → +20

b → −20

$+20 - 20 - \frac{20 \times 20}{100} = -4\%$

$-\frac{x^2}{100}\%$

$x - x - \frac{x^2}{100}\%$

Profit & Loss

$$\frac{CP_1}{CP_2} = \frac{(100 \pm \text{loss or gain})_2}{(100 \pm \text{loss or gain})_1}$$

#014. A man sells two articles for the same price, one on 20% gain and the other on 25% gain. If one article's cost price is Rs.10000 then what will be the second's cost price?

i. Rs. 9600

ii. Rs. 9500

iii. Rs. 11400

iv. Rs. 11600

$$\frac{10000}{CP_2} = \frac{100+25}{100+20}$$

$$\Rightarrow \frac{10000}{CP_2} = \frac{125}{120} = \frac{25}{24}$$

$$\Rightarrow CP_2 = 9600 \times 25$$

third digit

Profit & Loss

#15. After selling an article for Rs. 78, a shopkeeper gains twice as he gains after selling the article for Rs. 69. Find the cost price of the article.

i. 65

ii. 60

iii. 72

iv. 55

CP = Rs. x

Profit_1 : $(78 - x)$

Profit_2 : $(69 - x)$

$(78 - x) = 2 \times (69 - x)$

$\Rightarrow 78 - x = 138 - 2x \Rightarrow x = 60$

Profit & Loss

$SP_1 = 120x$

#Q16. A shopkeeper sells an article at 20% profit. Had he bought it for 10% less and sold it for Rs. 15 less he would have earned 30% profit. Find the CP of article.

$CP_1 \rightarrow 100x \rightarrow 500$

i. 600

ii. 500

iii. 585

iv. 550

$CP_2 \rightarrow 90x$ ← 30% profit

$SP_2 \rightarrow 120x - 15$

$$90x \times \frac{130}{100} = 120x - 15$$

$$\Rightarrow 117x = 120x - 15$$

$$\Rightarrow x = 5$$

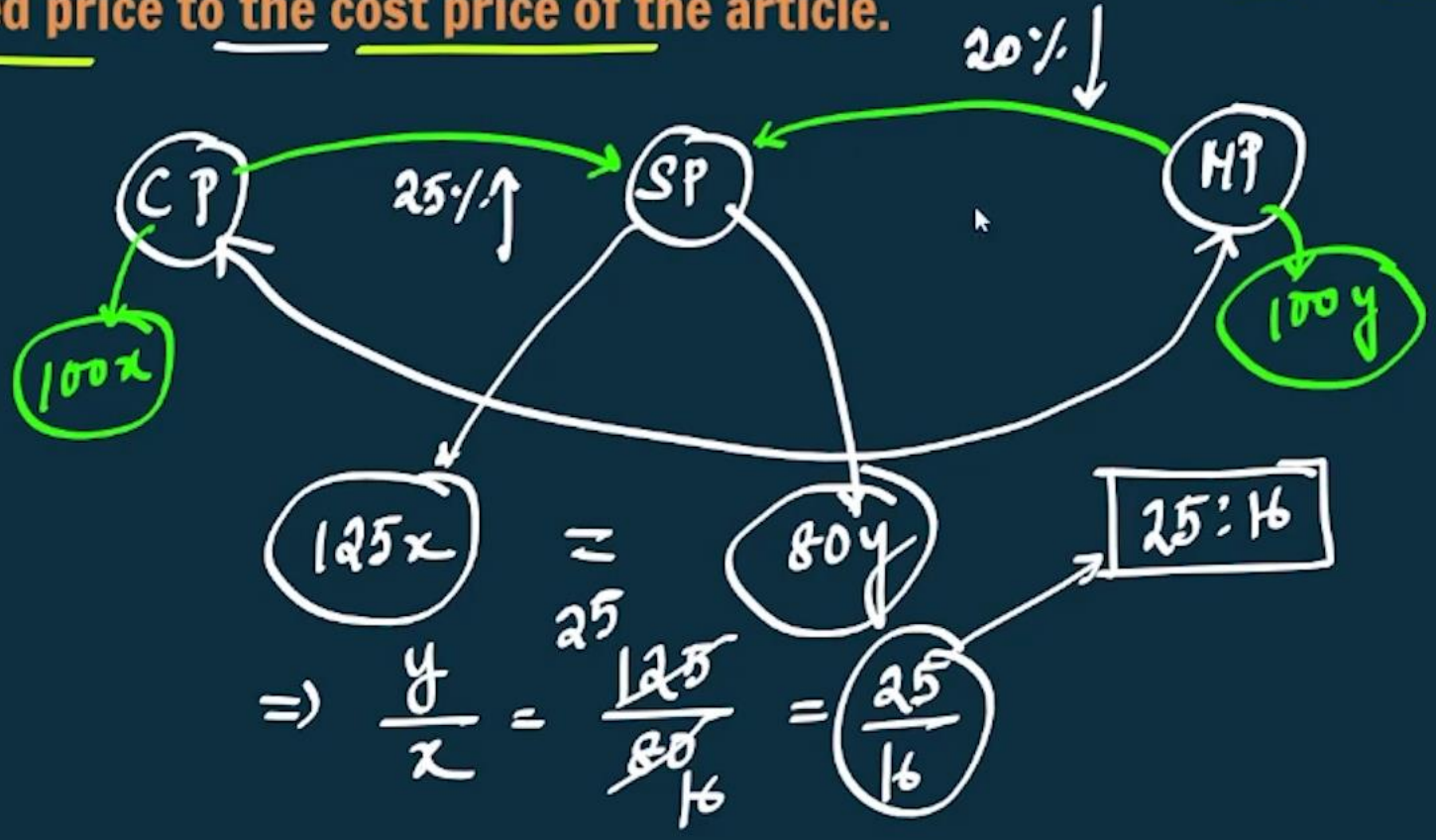
Profit & Loss

Discount

MP : CP = 100y : 100x
= y : x

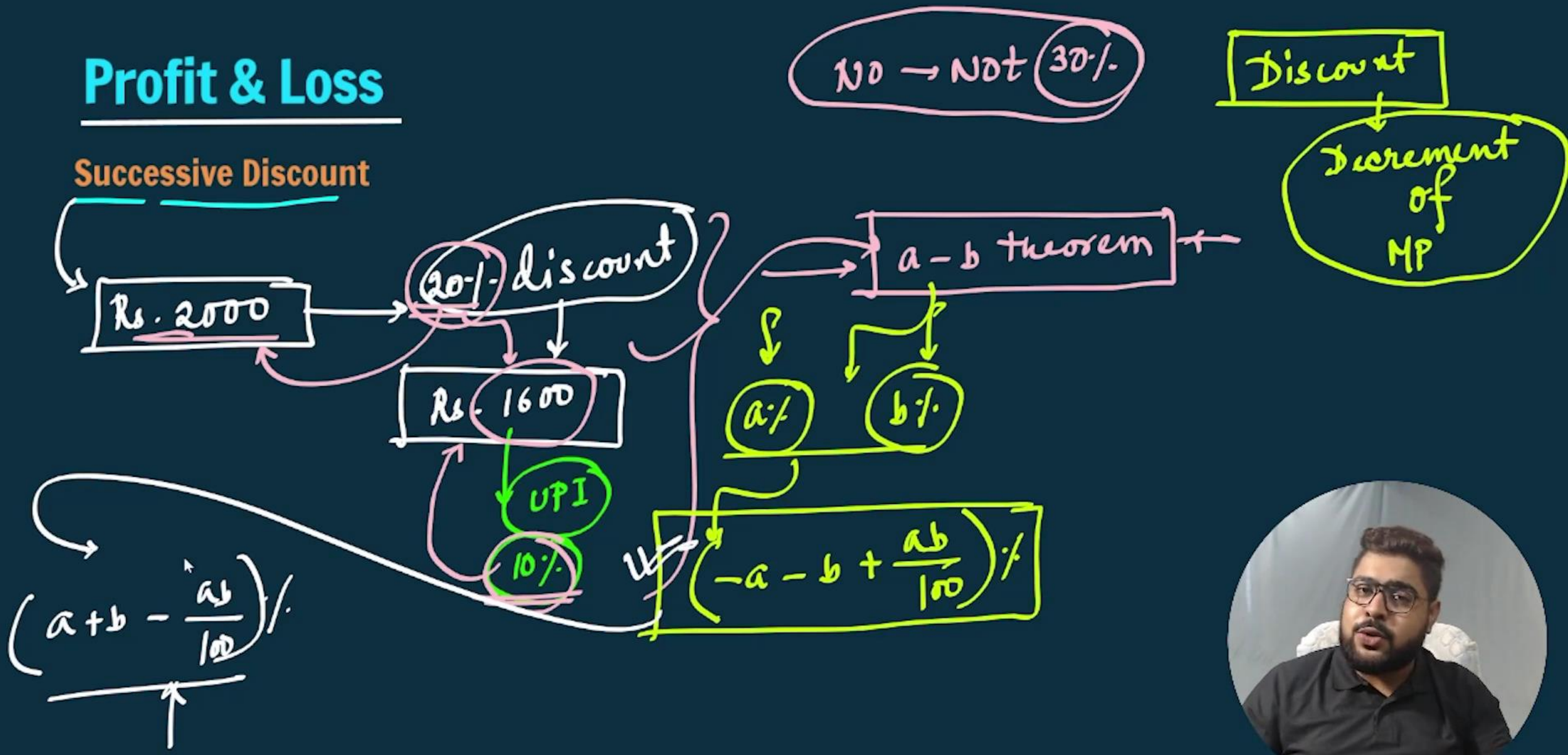
#17. A shopkeeper sells an article at 25% profit after allowing a discount of 20%. Find the ratio of the marked price to the cost price of the article.

i. 16:25
ii. 25:16
iii. 9:16
iv. 25:21



Profit & Loss

Successive Discount



Profit & Loss

4% × 10000 = 4/100 × 10000 = 400

Q18. A single discount of 50% on an article costing ₹10000 is better than two successive discounts of 40% and 10% by ____:

i. Rs. 400
ii. Rs. 1000
iii. Rs. 500
iv. Rs. 600

46% discount

−40 − 10 (+) 40 × 10 / 100

= −50 + 4

= (−)46%

Profit & Loss

MP

Q19. The price of an article is raised by 20% and then sold after giving two successive discounts of 10% each. Ultimately, the SP of the article is approximately what percent of its CP?

i. 90%
ii. 105%
iii. 95%
iv. 110%

CP → 100x → MP → 120x

net discount = $-10-10+\frac{10\times10}{100}$

$= -19\%$

SP → $120x \times \frac{81}{100} = \frac{486x}{5}$

$\left(\frac{\frac{486x}{5}}{100x} \times 100\right)$

$\frac{486\times2}{5\times2} = \frac{972}{10} \approx 97.2\%$