GATE

Data Science & AI

General Aptitude

QUANTITATIVE APTITUDE

Lecture No.- 04

By- Amulya Ratan Sir

Recap of Previous Lecture

Topic — Clocks

Topics to be Covered

Topic-1 Average

Topic-2 Percentage

$$\boxed{\frac{n+1}{2}} \text{ Natural}$$

Start

$$\boxed{n+1} \quad \boxed{n}$$

$$301 - 500$$

$$\boxed{200 - 600}$$

$$A = \frac{Sum}{No.}$$

(N) 302   499

$$599^{e}$$

(E) 302   498   201

(O) 303   202   499   598

400

$$\boxed{A} \times \boxed{No.} = Sum$$

$$(n+1) \times n = n(n+1) \Rightarrow \text{Sum of every no.}$$

$$n \times n = n^2 \Rightarrow \text{Sum of odd no.}$$

#Q. What is the average of first five multiples of 12?
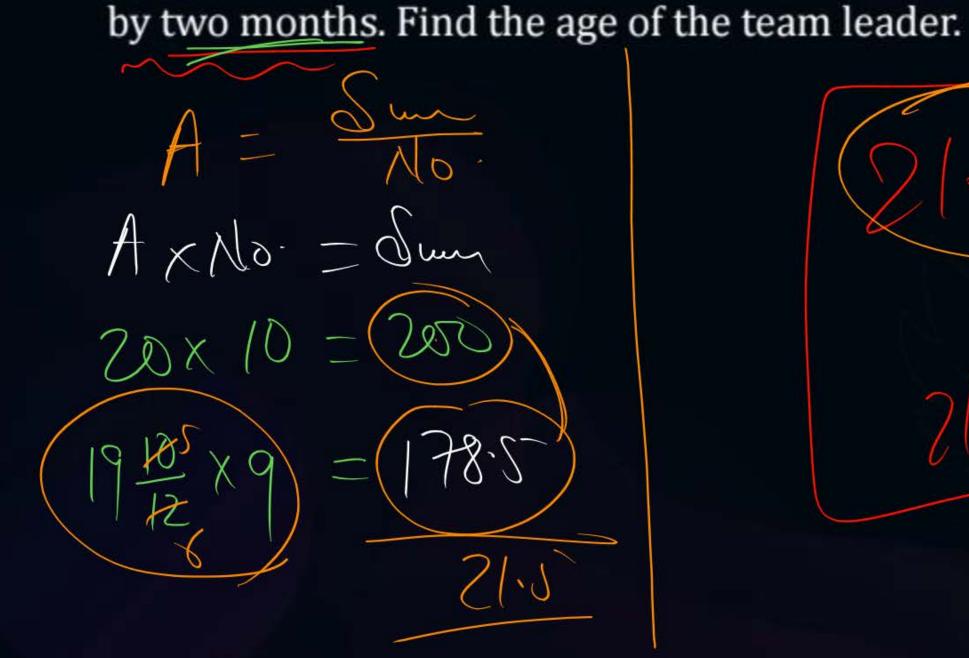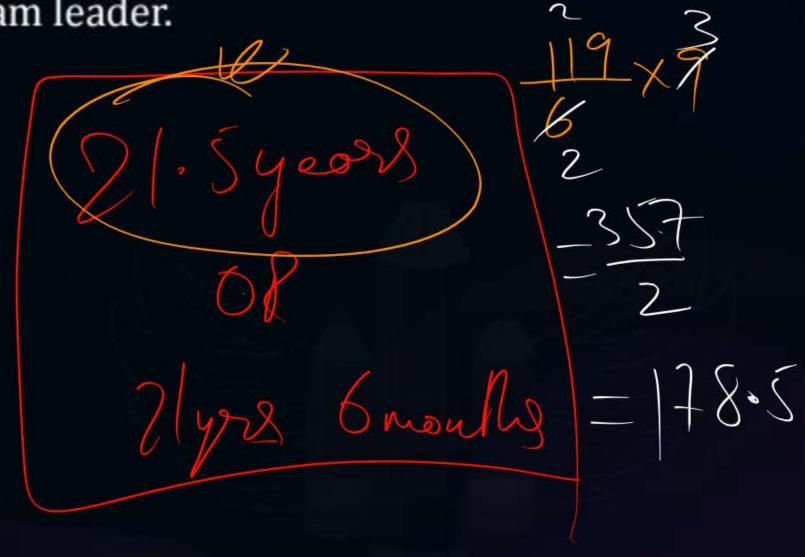
$$12, \ 24, \ 36, \ 48, \ 60$$

A. 42

B. 40

C. 36

D. 48

#Q. A class with 20 students has the average age as 14 years. When the teacher is included in the group, the average becomes 16 years. What would be the age of that teacher?

$$A = \frac{Sum}{No.}$$

$$\Rightarrow A \times No. = Sum$$

$$14 \times 20 = 280$$
$$16 \times 21 = 336$$

56 years

[MCQ]

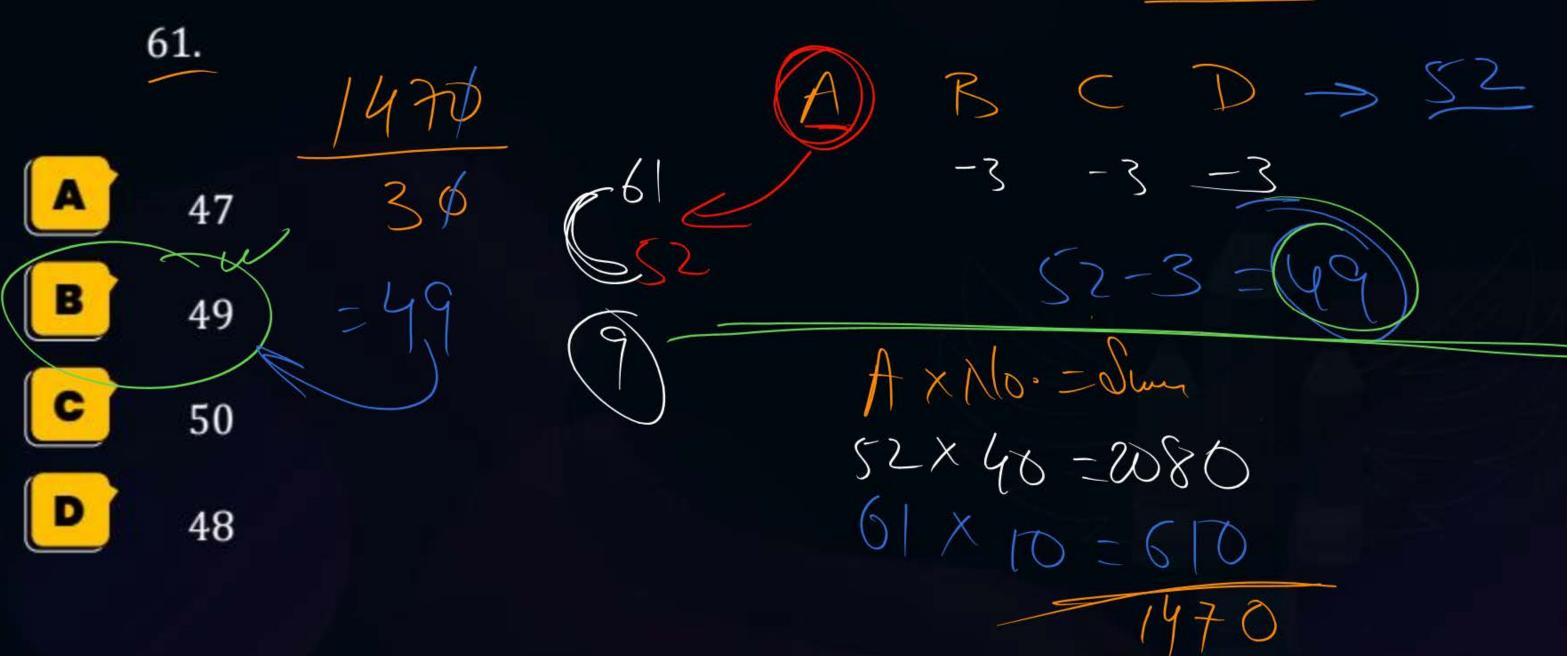#Q. A team of 10 employees has the average age as 20 years. If team leader is excluded from the group the average of remaining 9 employees decreases by two months. Find the age of the team leader.

$$A = \frac{Sum}{No.}$$

$$A \times No. = Sum$$

$$20 \times 10 = \boxed{200}$$

$$19\frac{10^5}{12_6} \times 9 = \boxed{178.5}$$

$$21.5$$

$$\boxed{21.5 \text{ years}}$$

OR

$$21 yrs \; 6 months$$

$$\frac{119^2}{6_2} \times 9^3 = \frac{357}{2}$$

$$= 178.5$$

#Q. In a school with 15 teachers, the average monthly salary is ₹4500. When three teachers left the school, the average monthly salary decreased by ₹600. Find the average monthly salary of three teachers who left the school.
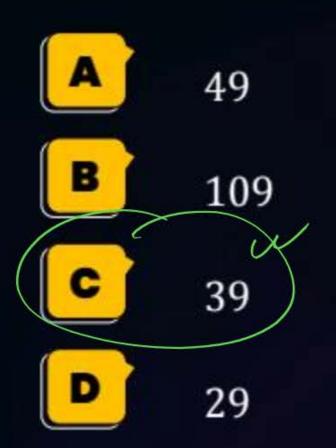
$$A \times No. = Sum$$

$$4500 \times 15 = 67,500$$

$$3900 \times 12 = 46,800$$

$$20,700$$

$$6900$$

$$\frac{20700}{3} = 6900$$

#Q. The average score of a class of 40 students is 52. What will be the average score of the rest of the students if the average score of 10 of the students is 61.
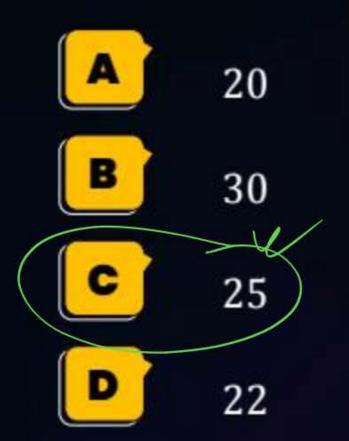
A. 47

B. 49

C. 50

D. 48

$$\frac{1470}{30}$$

$$= 49$$

(A)   B   C   D → 52

61   -3   -3   -3

52

9   52 - 3 = 49

$A \times No. = Sum$

$52 \times 40 = 2080$

$61 \times 10 = 610$

1470

#Q. The average weight of a school of 40 teachers is 80 kg. If, however, the weight of the principle be included, the average decreases by 1 kg. What is the weight of the principal?

A   49

B   109

C   39

D   29

#Q.   The average age of Abhijeet and Daya is 20 years. Their average age 5 years hence will be
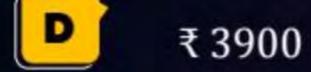
after

A   20

B   30

C   25

D   22

#Q. The average monthly salary of 20 employees is ₹1500. If the manager's salary is added the average becomes ₹1600. The manager's salary is

Assignment

A ₹ 3500

B ₹ 3600

C ₹ 3800

D ₹ 3900

#Q. Three years ago, the average age of a family of 5 members was 17 years. A baby having been born, the average of the family is the same today. What is the age of the baby?

2 years

A — 6 months

B — 9 monthjs

C — 1 year

D — 2 years

Assignment

(P.W)

#Q. 12 years ago, the average age of a husband and his wife was 20yrs. The average age is same today, they having two children. What is the present age of the youngest child if children differ in age by 2yrs?

A   8

B   6

C   7

D   9

Assignment

(P W)

#Q.   The average of 5 consecutive integers starting with x is y. What is the average of 6 consecutive numbers starting with $(x+2)$?

A $y + 3$

B $\dfrac{2y + 9}{2}$

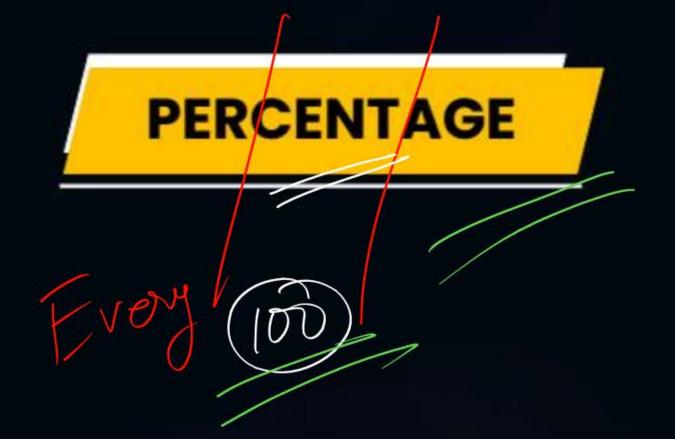**C** $y + 2$

D $\dfrac{2y + 5}{2}$

#Q.   A cricketer has certain average of runs for his 64 innings. In his 65th innings, he is bowled out for no score on his part. This brings down his average by 2 runs. His new average is?
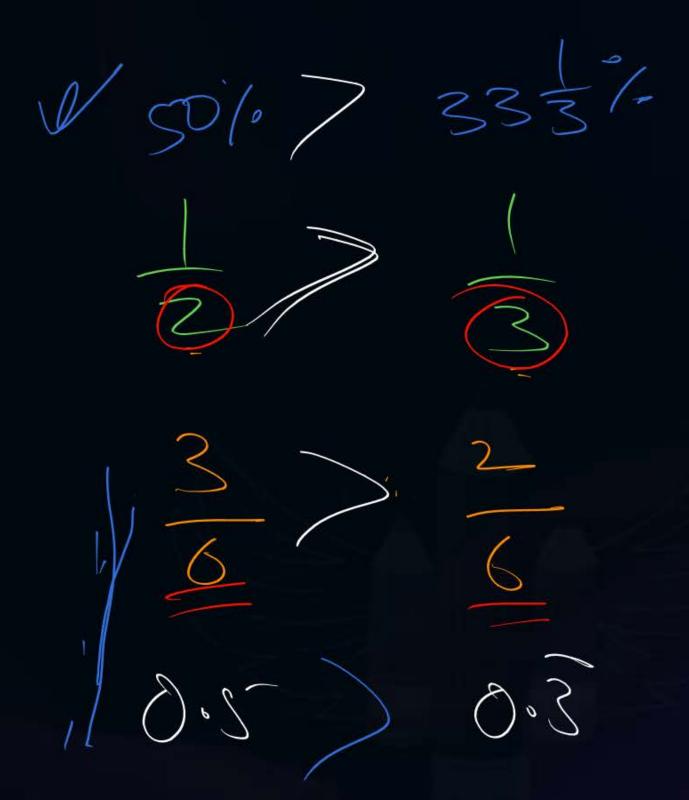
A   130

B   128

C   70

D   68

PERCENTAGE

Every (100)

$$50\% > 33\tfrac{1}{3}\%$$

$$\frac{1}{2} > \frac{1}{3}$$

$$\frac{3}{6} > \frac{2}{6}$$

$$0.5 > 0.3$$

PERCENTAGE

$$100\% = \boxed{1} = 1$$

65%

$66\frac{2}{3}\% = \frac{2}{3} = 0.\overline{6}$

70%

$5\% = \frac{1}{20} = 0.05$

$10\% = \frac{1}{10} = 0.1$

$15\% = \frac{3}{20} = 0.15$

$20\% = \frac{1}{5} = 0.2$

$25\% = \frac{1}{4} = 0.25$

$30\% = \frac{3}{10} = 0.3$

30%

$33\frac{1}{3}\% = \frac{1}{3} = 0.\overline{3}$

35%

$125\% = 1.25$

$= \frac{5}{4}$

$Successive$ $.331$

0.5×0.5

$= 0.25$

$0.75 \times$

$0.5 \times 0.8 = 0.4$

$1.5 \times 0.5 = 0.75$

1.331

$= 1.1 \times 1.1 \times 1.1$

$50\% \downarrow + 50\% \downarrow = 75\% \downarrow$

$50\% \downarrow + 20\% \downarrow$ $= 60\% \downarrow$

0.6

$50\% \uparrow + 50\% \downarrow$ $25\% \downarrow$ 0.25

$10\% \uparrow + 10\% \uparrow + 10\% \uparrow$ $= 33.1\% \uparrow$

'का'

'of'

'$\times$'
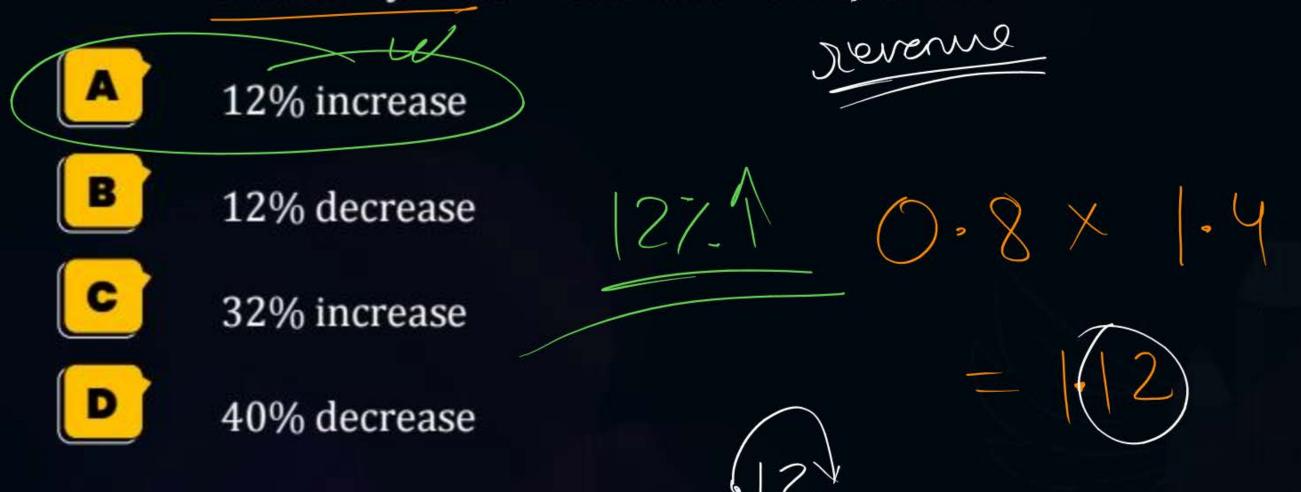
#Q. When the price of mobile reduced by 20%, the number of mobile sold increased by 40%. The effect on the s~~al~~e was?

revenue

A 12% increase

B 12% decrease

C 32% increase

D 40% decrease

$12\%\uparrow$

0.8×1.4

$= 1.12$

#Q. A trader offers three successive discounts of 20%, 10% and 5% to a customer. How much is overall single discount?

A 30%

B 31.6%

C 35%

D 68.4%

$$1 - 0.684 = 0.316$$
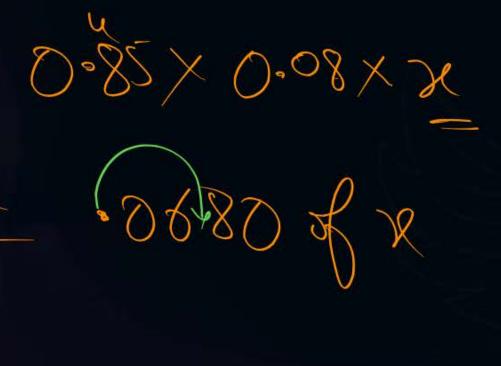
$$0.8 \times 0.9 \times 0.95$$

$$= 0.72 \times 0.95$$

$$= 0.684$$

$$31.6\%$$

#Q. 8% of the people eligible to vote are between 20 and 25 years of age. In an election 85% of those eligible to vote, who were between 20 and 25 actually voted. In that election number of person between 20 and 25, who actually voted, was what percentage of those eligible to vote?
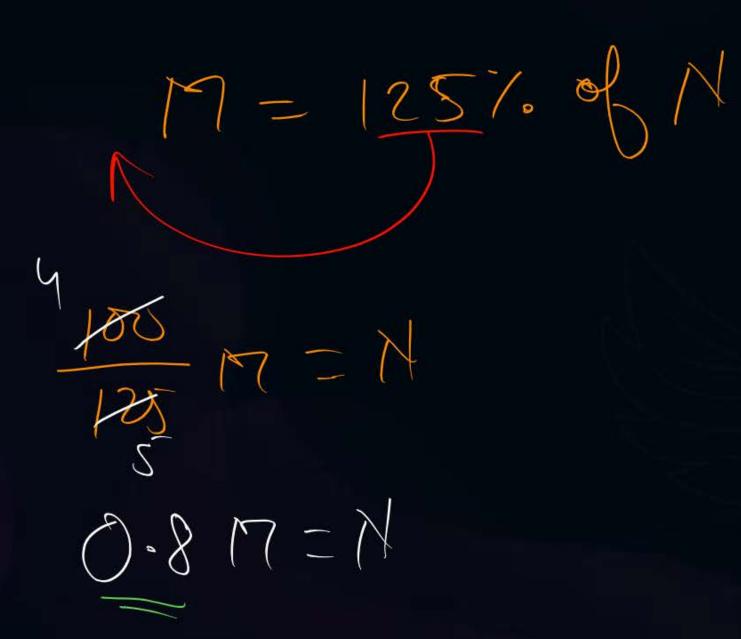
A   4.2%

B   8%

C   6.4%

D   6.8%

$$0.85 \times 0.08 \times x$$

$$= 0.0680 \ of \ x$$

$$6.8\% \ of \ x$$

% Comparision

Harsh ⟹ M

Me ⟹ N

#Q. If M is 25% more than N, then N is how much percent less than M?

$$M = 125\% \text{ of } N$$
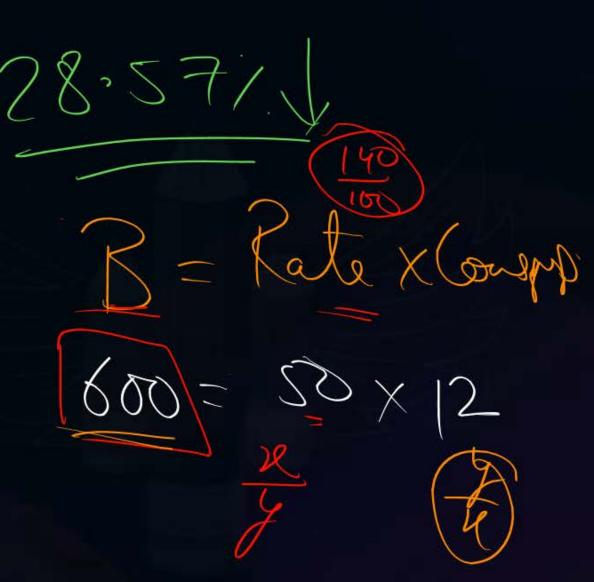
$$\frac{100}{125} M = N$$
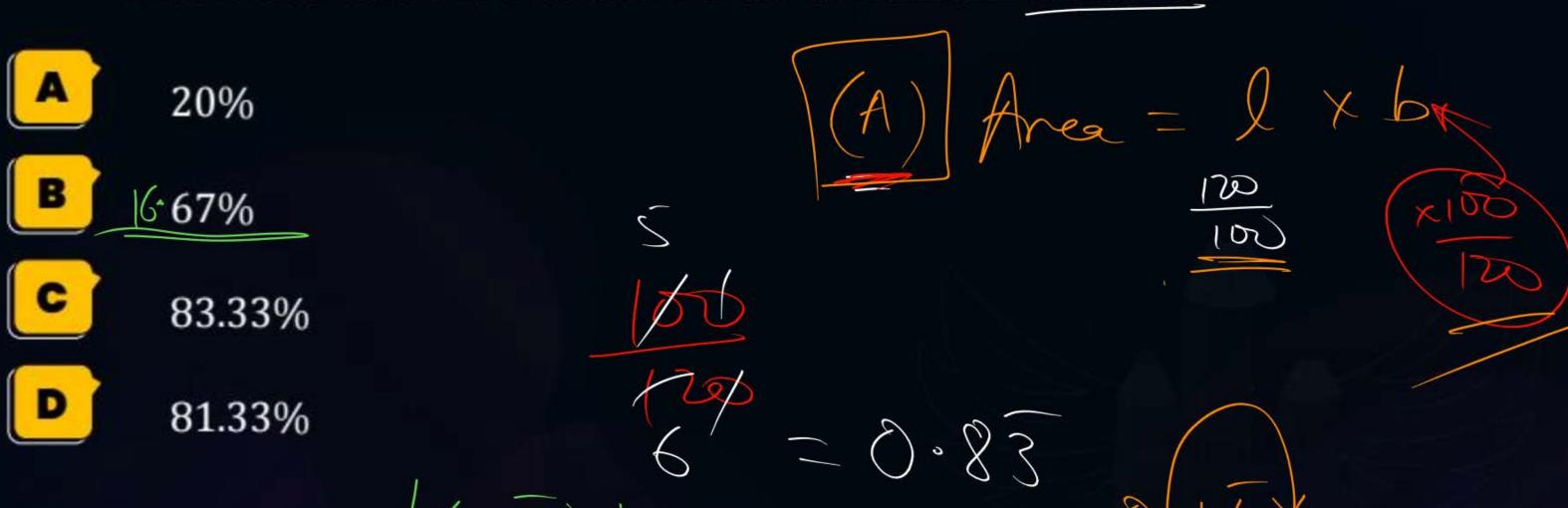
$$0.8\, M = N$$

0.2↑

20%↓

#Q. If the petrol rate is increased by 40%, then by how much percentage we should decrease our consumption, in order to maintain same budget?

A. 71.42%

B. 40%

C. 28.57%

D. 60%

$$\frac{5}{7} \quad \frac{100}{140}$$

$$= 0.7143$$

$$= 0.2857$$

$$28.57\% \downarrow$$

$$\frac{140}{100}$$

$$B = Rate \times Consp$$

$$600 = 50 \times 12$$

$$\frac{x}{y}$$

#Q. If the length of a rectangle increase by 20%, then by how much percent we should decrease the breadth in order to maintain same area?

A 20%

B 16.67%

C 83.33%

D 81.33%

(A) Area $= l \times b$

$\dfrac{120}{100}$

$\dfrac{\times 100}{120}$

$\dfrac{5}{100}{120}$

$6 = 0.8\overline{3}$

$16.\overline{6}\% \downarrow$

$0.1\overline{6}\times$

$$Error\% = \frac{difference}{A.V.} \times 100$$

$$\boxed{\% \ increase}$$

$$\boxed{\% \ decrease}$$

$$\frac{9}{45} \times 100$$

$$20°c \qquad 18°c$$

$$\frac{2}{20} \times 100$$

$$= \underline{10\%}$$

#Q. Sanjeev saves 20% of his income. If his income is increased by 20% and expenditure decreased by 10%, then find the percentage change in his savings.

$$\frac{28}{20} \times 100$$

$$= 140\% \uparrow$$

Income
$$20\% \uparrow \quad 100$$
$$120$$

Saving
$$20 \quad ?$$
$$48$$

Exp
$$80 \quad 10\% \downarrow$$
$$72$$

#Q. If the side of a square is increased by <u>20</u>%, then what is the percentage change in its area?

A 44%

B 80%

C 22%

D 144%

$A = S \times S$

$1.44 = 1.2 \times 1.2$

$44\% \uparrow$

#Q.   The population of a town doubled every 5 years from 2000 to 2015. What is the percentage increase in population in this period?

A   800%

B   400%

C   700%

D   600%

Assignment

#Q.   If P is 60% taller than Q, by what percent is Q shorter than P?

A   40%

B   37.5%

C   62.5%

D   None of these

Assignment

#Q.   A is twice B and B is 200% more than C. By what percent is A more than C?

A   200%

B   400%

C   500%

D   600%

#Q. The population of a village is 5500. If the number of males increases by 11% and the number of females increases by 20%, then the population becomes 6330. The population of the female in the village is?

A 2000

B 2500

C 3000

D 3500

Assignment

#Q. Rohan spends 40% of his monthly income on food items and 50% of the remaining on clothes and conveyance. He saves one-third of the remaining amount after spending on food, clothes and conveyance. If he saves Rs. 19200 every year, what is his monthly income?

A   32000

B   16000

C   12000

D   6000

#Q. 5% of income of P is equal to 15% of income of Q and 10% of income of Q equal 20% of income of R. If R's income is 2000, then What is total income of P, Q and R?

A 9000

B 12000

C 15000

D 18000

Topic

Average & Percentage

THANK - YOU