GATE

ALL BRANCHES

GENERAL APTITUDE

Quantitative Aptitude

Lecture No: 05

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TOPICS TO BE COVERED

1. More on Mixtures Alligations
2. Concept of Counting Theory
3. With & Without repetition ways
4. Questionnaire on the Topic

More Questions:

x = 5 litre

A 40 litres of mixture contains 10% water in it and remaining milk. How many litres of water are to be added to the mixture, so that it would become 20% water in it?

40 litre Mix

Water 4 litre

Milk 36 litre

$$\frac{36}{40+x} = \frac{80}{100}$$

$$\frac{4+x}{40+x} = \frac{20}{100}$$

$$\frac{4+x}{36} = \frac{20}{80}$$

Q. A 40 litres of mixture contains 10% water in it and remaining milk. How many litres of water are to be added to the mixture, so that it would become 20% water in it?

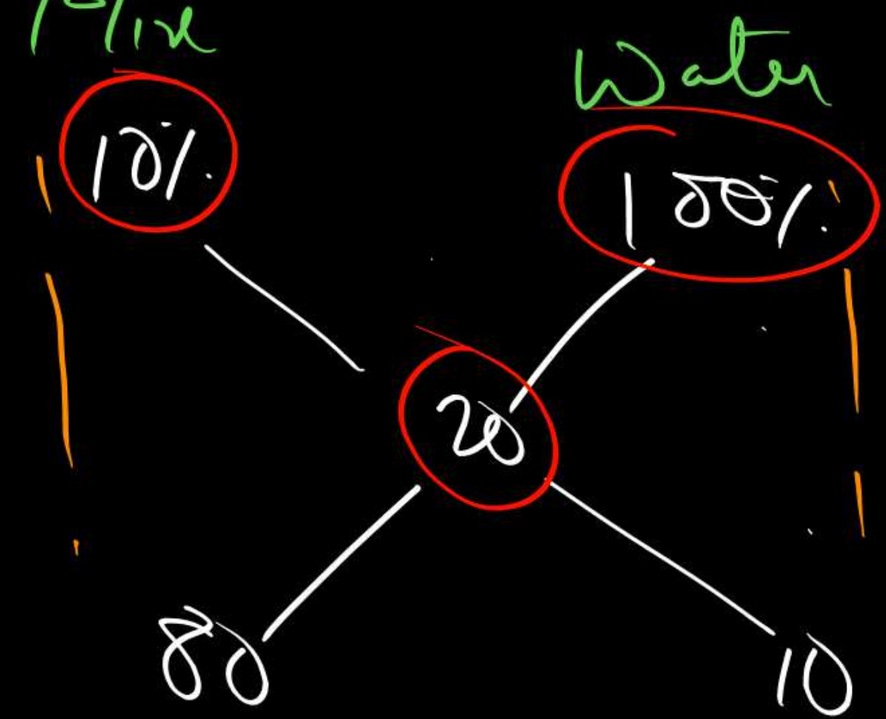
Mix : Water

= 80 : 10

= 8 : 1

×5 ×5

= 40 : 5



8 x

1 x

Q. In a mixture of 40 litres, the ratio of milk and water is 4:1. How much water much be added to this mixture so that the ratio of milk and water becomes 2:3?

A. 20 litres

B. 32 litres

C. 40 litres

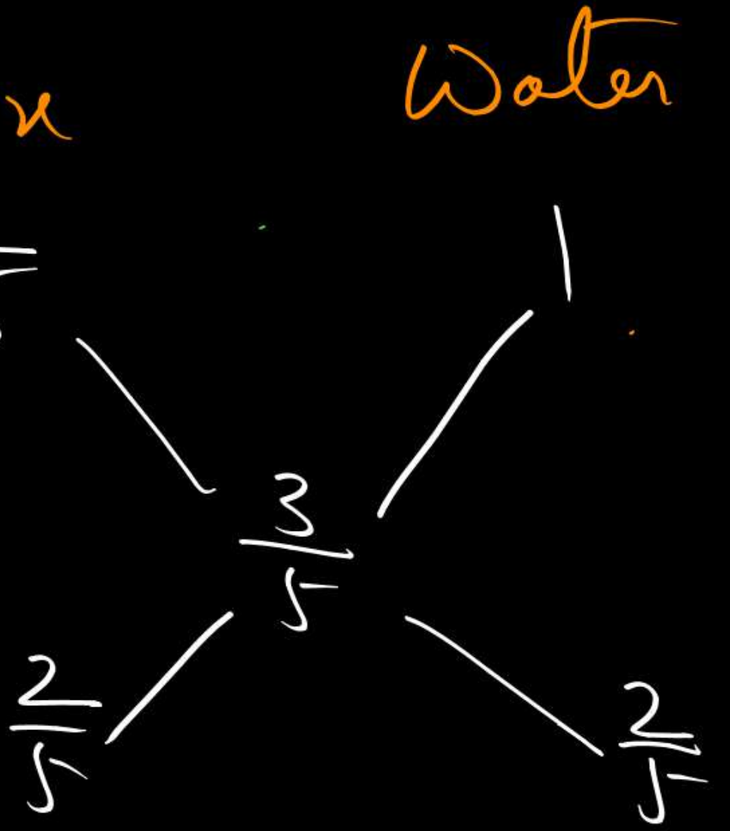
D. 30 litres

Mix : water

$= \frac{2}{5} : \frac{2}{5}$

$= 1 : 1$

$= 40 : 40$



$$24B + 18G = 20B + 20G$$

$$4B = 2G$$

$$\frac{B}{G} = \frac{2}{4}$$

Q. An alloy A consist of iron & copper in the ratio 5 : 7, whereas alloy B consist iron & copper in the ratio 3 : 1. In what ratio these two alloys are to be mixed to form a new alloy with iron & copper in the ratio 2 : 1?

A. 5 : 13

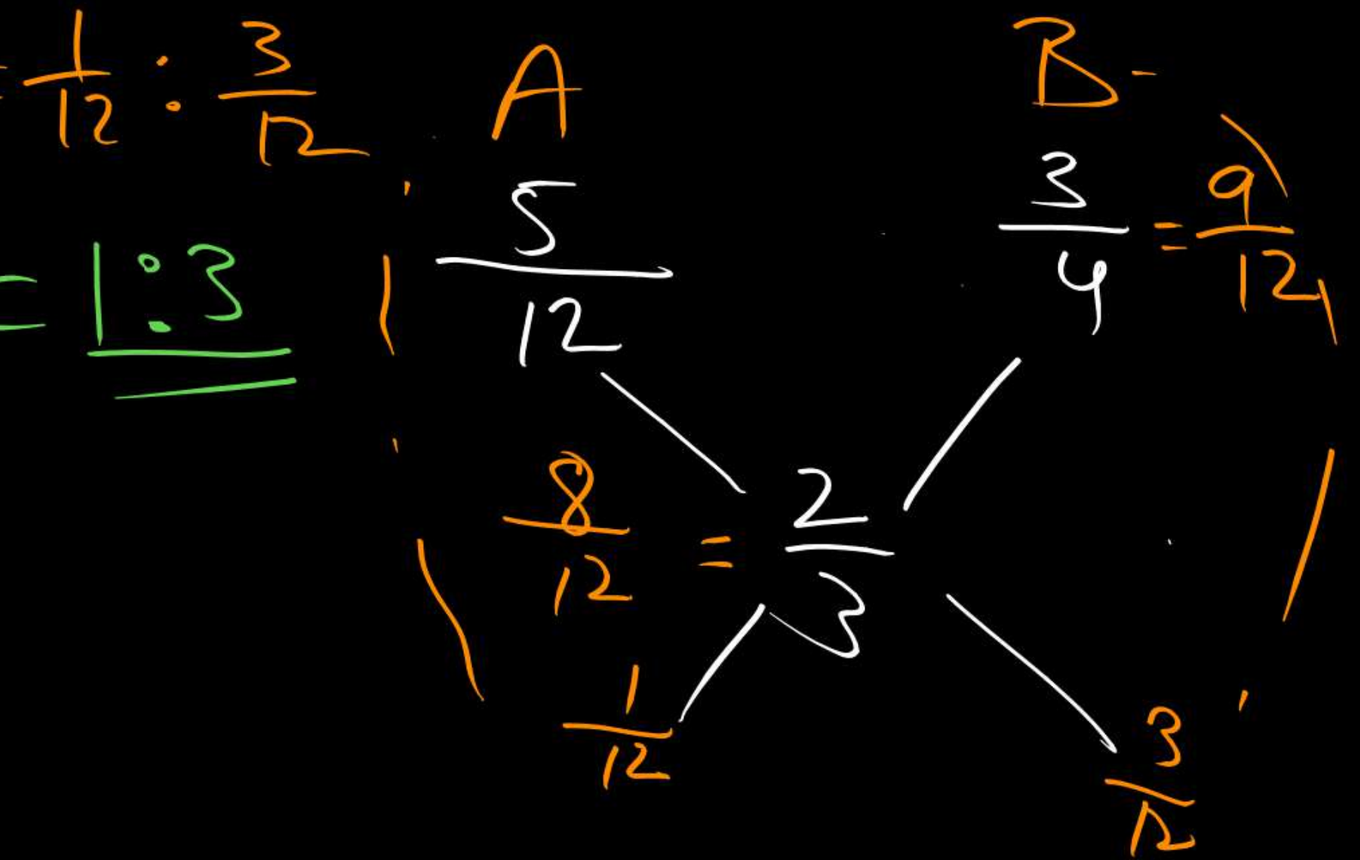
B. 3 : 1

C. 7 : 5

D. 1 : 3

$A:B = \frac{1}{12} : \frac{3}{12}$

$= 1 : 3$



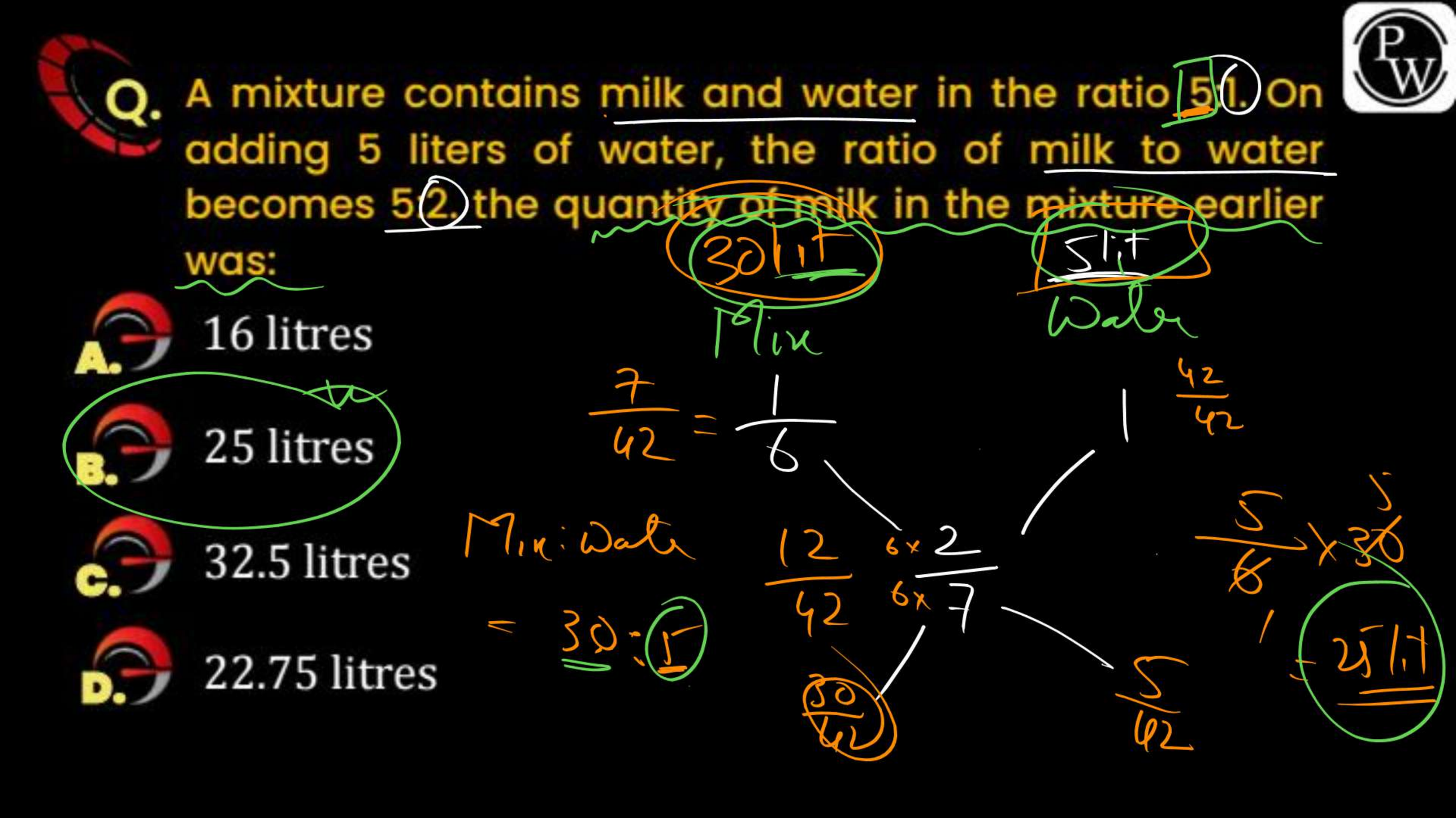
Q. A mixture contains milk and water in the ratio 5 : 1. On adding 5 liters of water, the ratio of milk to water becomes 5 : 2. the quantity of milk in the mixture earlier was:

A. 16 litres

B. 25 litres

C. 32.5 litres

D. 22.75 litres



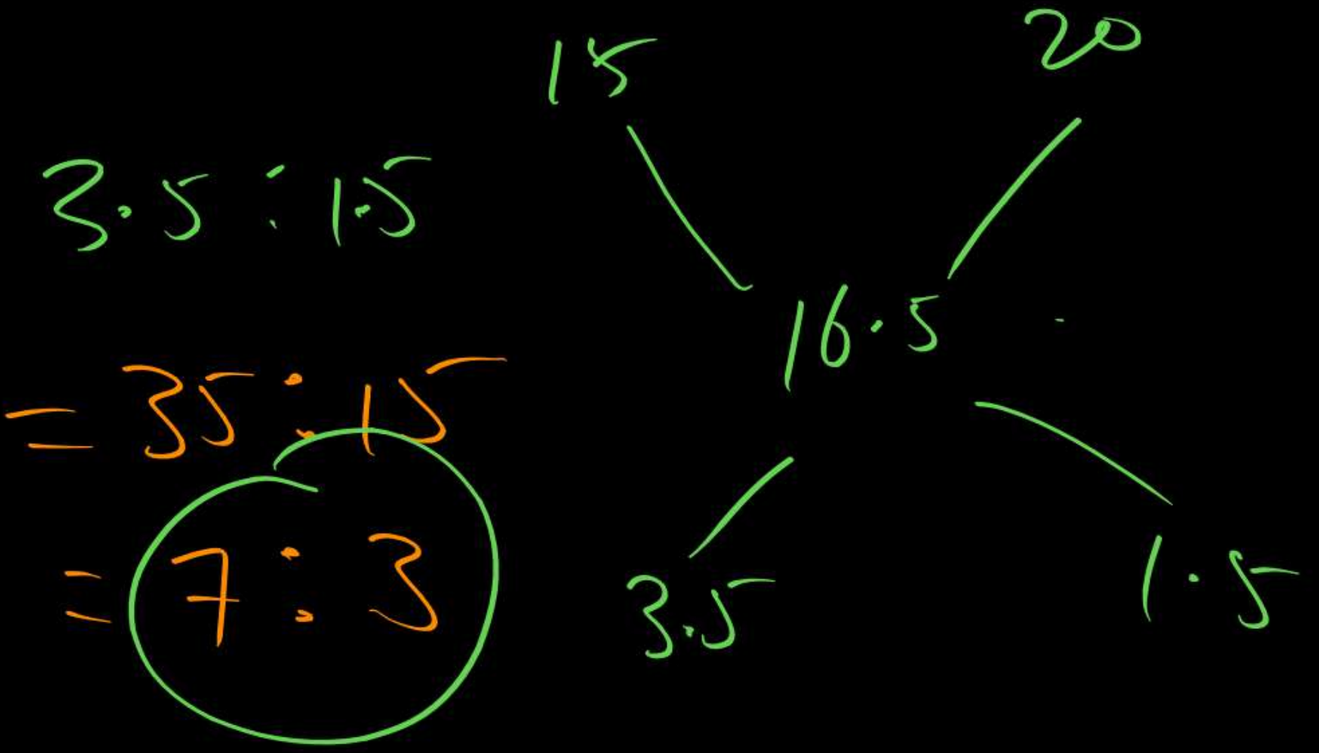
Q. In what ratio must a grocer mix two varieties of pulses costing ₹15 and ₹20 per kg respectively so as to get a mixture worth ₹16.50 per kg?

A. 5:3

B. 7:3

C. 3:8

D. 4:5



Q. In what ratio must Ankit mix two varieties of sugar worth ₹20 per kg and ₹32 per kg so that by selling the mixture at ₹36 per kg he may gain 20%?

A. 3 : 2

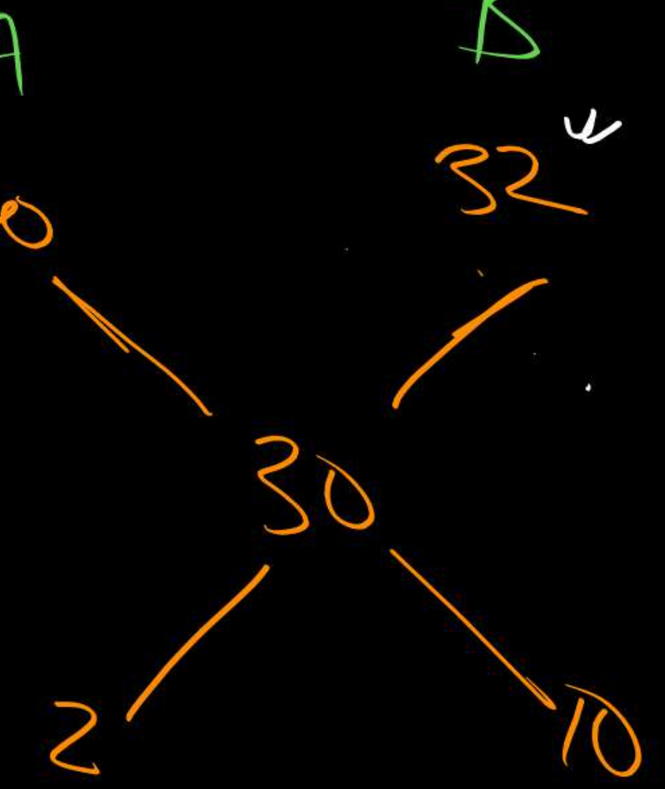
B. 2 : 3

C. 3 : 5

D. 1 : 5

$A : B = 2 : 10$

$= 1 : 5$



S.P = 36

P = 20%

$\frac{36}{C.P} = 1.2$

$\frac{36}{1.2} = \frac{30}{1} = C.P$

Q. A man buys milk at ₹5 per litre and after adding water, sells it at ₹6 per litre, thereby making a profit of $33\frac{1}{3}\%$. What is the proportion of milk to water in the mixture?

A. 1 : 9

B. 9 : 10

C. 9 : 1

D. 4 : 5

Q. A man purchases two mobiles for ₹65390, sells both of them so as to gain 13½ % on one and lose 2¾ % on other. If on the whole he gains 7¼ %, then what would be the cost of cheaper mobile?

A. ₹32000

B. ₹25150

C. ₹27500

D. ₹31000

NUMBERS

← Quantitative

Counting → Calculation

Measurement

Comparision

(या) OR (+)

(और) AND (×)

Counting Theory

Q. In how many different ways you can choose your ATM PIN ?

0000

9999

8

9

0 1 2 3 4 5 6 7

10 × 10 × 10 × 10

= 10,000

Q. In how many different ways you can select a six digit phone password/passcode ?

$10 \times 10 \times 10 \times 10 \times 10 \times 10$

$= 10,00,000$

Q. How many four digits number can be formed using 1, 2, 3, 4 & 5?

Repetition Allowed

Th	H	Te	U
5	5	5	5

$= 5 \times 5 \times 5 \times 5$

$= 625$

Repetition Not Allowed

Th	H	Te	U
5	5-1	5-2	5-3

$5 \times 4 \times 3 \times 2$

$= 120$

Q. In how many different ways you can choose your ATM PIN which is an even ?

$10 \times 10 \times 10 \times 5$

$= 5000$

0, 2, 4, 6, 8

Q. How many three digits number can be formed using digits 0 to 9?

Repetition Allowed

H	Ten	U
9	10	10

$9 \times 10 \times 10$

$10-1$

$= 900$

Without Repetition

H	$10-1$ Ten	$10-2$ Unit
9	9	8

$9 \times 9 \times 8$

$= 81 \times 8 = 648$

Q. In how many ways four letters can be posted in 6 post boxes, if each box can take any number letters?

A. 4096

B. 1500

C. 24

D. 1296

$L_1 \quad L_2 \quad L_3 \quad L_4$

$6 \times 6 \times 6 \times 6$

$= 36 \times 36$

$= 1296$

Q. In how many ways can you arrange 5 Novels on a shelf?

A. 720

B. 120

C. 360

D. 300

$5 \times 4 \times 3 \times 2 \times 1$

5-1 5-2 5-3 5-4

$= 120$

Q. Four persons A, B, C and D are to be seated in a row. C should not be seated at the second position from the left end of the row. The number of distinct seating arrangements possible is?

A. 6

B. 9

C. 18

D. 24

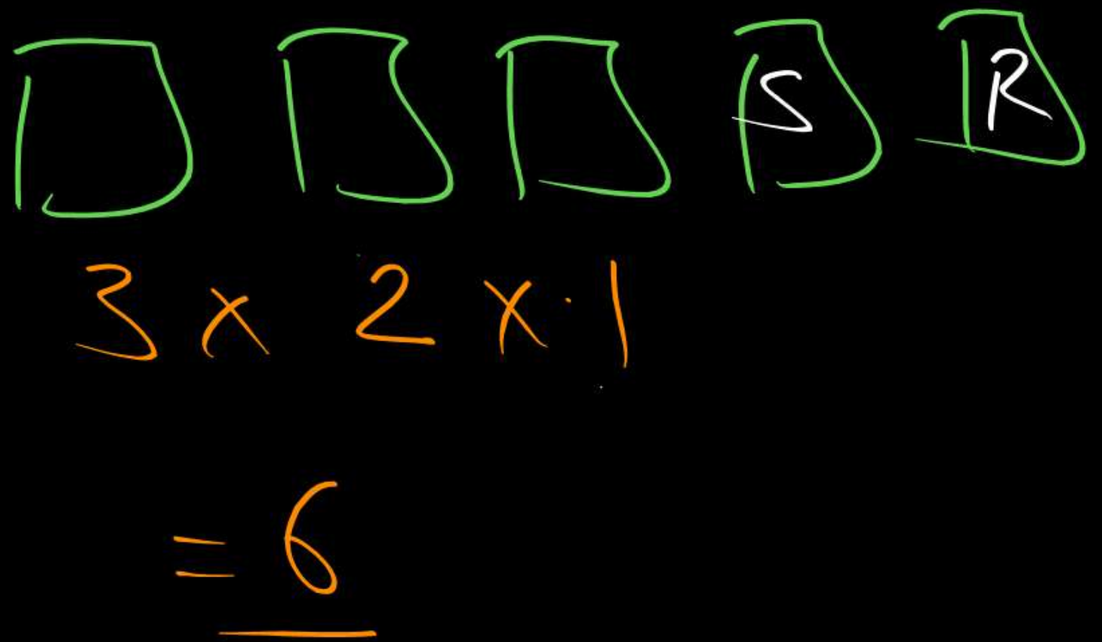
Q. Five different book (P, Q, R, S, T) are to be arranged on a shelf. The books R and S are to be arranged first and second, respectively from the right side of the shelf. The number of different orders in which P, Q and T may be arranged is?

A. 12

B. 2

C. 120

D. 6



Q. A library has two books each having three copies and three other books each having two copies. In how many ways can all these books be arranged in a shelf so that the copies of the same book are not separated?

A. 80

B. 100

C. 120

D. 140

Q. A license plate begins with 3 letters. If the possible letters are A, B, C, D and E, how many different ways these letters can be written if no letter is used more than once?

Thank You !