Strategic Arithmetics

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CSA102: Mathematics-I

Quick Revision
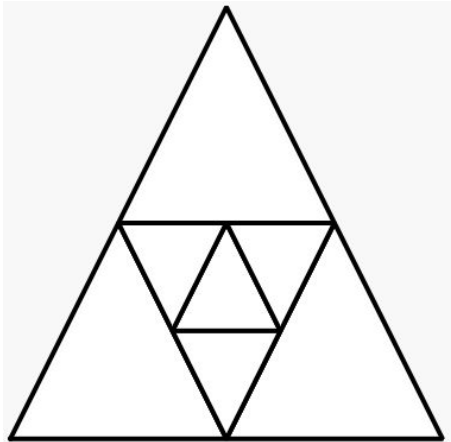
In the last class, you studied how to do strategic calculations on-

- Numbers
- Fractions

Example

Color $5/16$ of the triangle

Ans.

Agenda

- Ratio and proportion
- Percentages
- Mixtures and Allegations

Ratio and Proportion

Example

Priya just got married and she has **10 guests** in her house. While making **halwa** for herself she puts **3 cups of semolina** with one cup of sugar to have the perfect taste. For **10 guests** she takes **18 cups of semolina**, what do you think how much sugar she should add in order to get the perfect taste?

Ratio

A ratio is a comparison of two numbers.

Ratios can be written in three different ways:

$$a \text{ to } b$$

$$a : b$$

$$\frac{a}{b}$$

Because a ratio is a fraction, b can not be zero

Ratios are expressed in simplest form

Example

Aarti has been reading a Book for class. She read 15 chapters in 3 days. What is the ratio of chapters read to the number of days she spent reading?
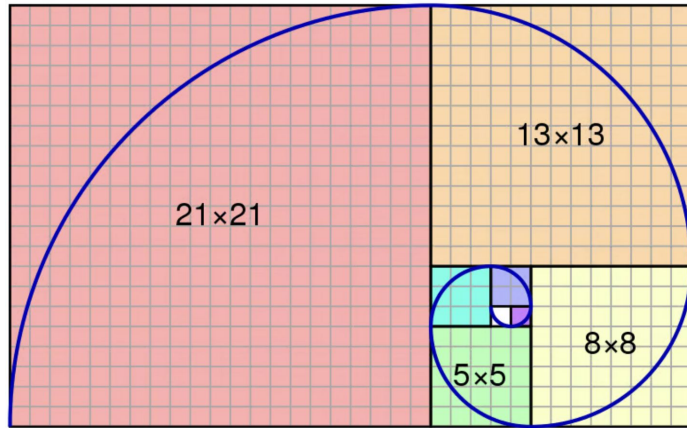
Example

You have $120 and are planning a trip to Argentina, where the currency is the Peso. With an exchange rate of approximately $3 for 1 Peso, how many Pesos would you receive if you exchanged all your money?

Ratio

Do You Know Golden Ratio??

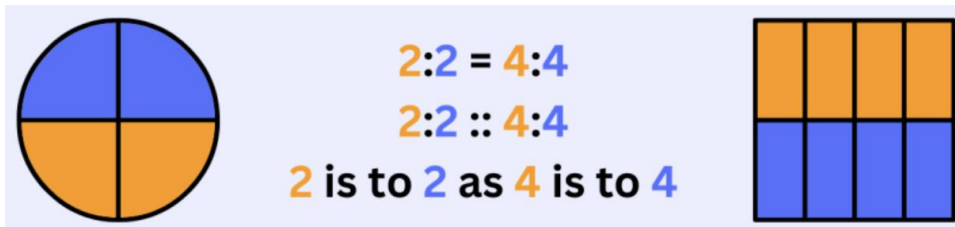$$\frac{a}{b} = \frac{a+b}{a} = 1.618.... = \Phi$$

Proportion

- A proportion is an equation in which two ratios are set equal to each other.

  Notation:

  - Proportions are denoted using the symbol ":::" or "="

$$a : b :: c : d \longrightarrow \frac{a}{b} = \frac{c}{d}$$

2:2 = 4:4

2:2 :: 4:4

2 is to 2 as 4 is to 4

Example

If A : B = 6 : 7 and B : C = 8 : 9 then what will be A : B : C?

Ans. 48 : 56 : 63

Example

Find the missing numbers in the following proportions.

(1) $30 : \boxed{} = 15 : 50$

(2) $17 : \boxed{} = 68 : 248$

(3) $100 : \boxed{} = 150 : 225$

(4) $12 : \boxed{} = 36 : 150$

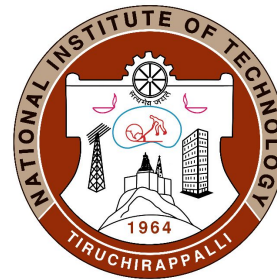(5) $10 : 25 = 5 : \boxed{}$

(6) $12 : 100 = 60 : \boxed{}$

Percentages

Example

Ramesh studies at Newton School of Technology, and his friend Suresh studies at NIT Trichy. Both had their mid-semester exams. Ramesh scored 15 out of 20 marks in math, while Suresh scored 40 out of 50 marks in math. Can you determine who scored more?

Percentage

- Percentage: Latin word "centum" meaning by 100.

- So in percentages you express all the ratios x by 100.

Example: The Indian stock Market

Ramesh received his first salary and decided to invest in Tata Motors stocks, purchasing them for Rs 100,000. In May, he made a profit of 22%, but following the disappointing Lok Sabha election results, he lost 12% in June. In July, his profit increased by 10%, but then he experienced a 30% loss due to a crash in the US market. What is the current value of his stocks?

Percentage

Can I say,
X% of Y = Y% of X ?

Mixtures and Allegations

Mixtures and Allegations :

How much water be mixed in 36 litre of milk worth Rs.40 per litre, so that value of mixture is Rs. 30 per litre?

Ans.

Mixtures and Allegations :

Ramesh's father has a jewellery shop where they sell 10 gram of gold for Rs 60000. The price for authentic gold is Rs 80000 per 10 gram. Considering Ramesh's father mix Copper to decrease price and lure customers, how much Copper of price Rs 10000 per 10g should he mix in 10 g of pure gold so that if he takes 10g of the resultant mixture its price is Rs 60000?

Ans.

Key Takeaways:

In today's class you read :

- Ratios
- Proportion
- Percentages
- Mixtures and Allegations

Thank You!