

Simplification- 2

SIMPLIFICATION- PART2

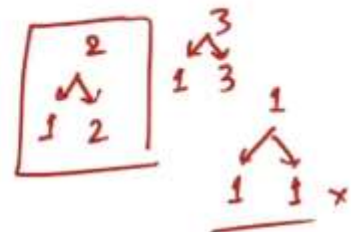
• Agenda

- ✓ Coprime
- ✓ Semi-Prime
- ✓ Composite number
- ✓ Recurring
- ✓ Surd & Indices
- ✓ Problems



SIMPLIFICATION- PART2

• What is Prime Number & Composite Number ?



✓ Prime Number is a number, which is divisible by 1 and itself.

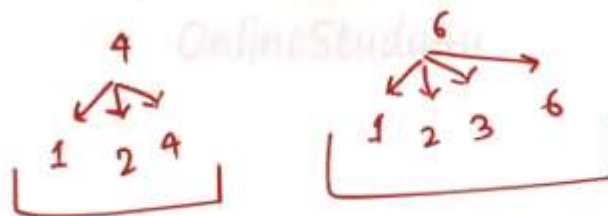
Eg: 2, 3, 5, 7, 11, 13 etc.

it should & must have two factors

eg. Q. 7, 11, 13, 17, 19, —

✓ Composite numbers are numbers with more than two factors. Numbers can be classified on the basis of the number of factors that they have.

Eg: 4, 6, 8, 9, 10 etc



SIMPLIFICATION- PART2

✓ What is Coprime Numbers ?

Co-prime numbers are pairs of numbers that do not have any common factor other than 1. There should be a minimum of two numbers to form a set of co-prime numbers.

Pairs of Co-prime Numbers

(2, 15) ✓

(3, 8)

(4, 9)

(5, 6)

(11, 14)

(15, 19)

(2, 15)

$$\left[\begin{array}{l} 2 = 1 \times 2 \\ 15 = 1 \times 3 \times 5 \end{array} \right]$$

3, 8

$$3 = 1 \times 3$$

$$8 = 1 \times 2 \times 2 \times 2$$



SIMPLIFICATION- PART2

• What is Semi-Prime Number?]

A **semiprime** number is the **product** of precisely **two prime numbers**, where the two prime numbers may be the same or different. Therefore, $5 \times 5 = 25$ and $17 \times 7 = 119$ are **semiprime numbers** since 5, 17, and 7 are all prime numbers.

Semi Prime Number Between 1 to 100.

4, 6, 9, 10, 14, 15, 21, 22, 25, 26, 33, 34, 35, 38, 39, 46, 49, 51, 55, 57, 58, 62, 65, 69, 74, 77, 82, 85, 86, 87, 91, 93, 94, 95

$$[4 = 2 \times 2]$$

2 Prime
2 Prime

$$6 = 2 \times 3 \quad 9 = 3 \times 3$$

$$\left[\begin{array}{l} 4 = 2 \times 2 \\ 9 = 3 \times 3 \end{array} \right] \quad \left[\begin{array}{l} 6 = 2 \times 3 \\ 10 = 2 \times 5 \end{array} \right]$$



SIMPLIFICATION- PART2

• Problem based on Semi Prime No.

Semi Prime Number Between 1 to 100.

4, 6, 9, 10, 14, 15, 21, 22, 25, 26, 33, 34, 35, 38, 39, 46, 49, 51, 55, 57, 58, 62, 65, 69, 74, 77, 82, 85, 86, 87, 91, 93, 94, 95



10x

$$[20 \text{ --- } 40]$$

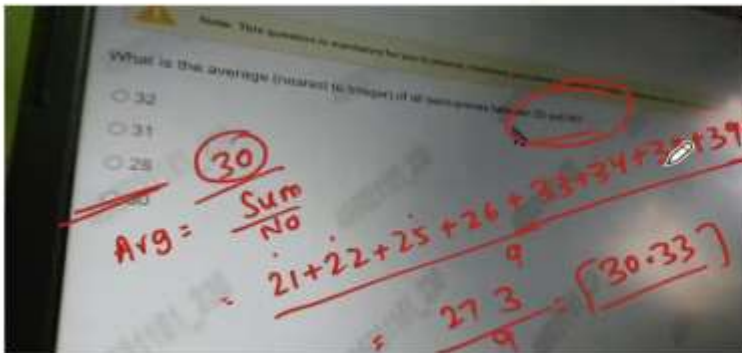
$$21 = 3 \times 7 \quad 34 = 2 \times 17$$

$$22 = 2 \times 11 \quad 35 = 5 \times 7$$

$$25 = 5 \times 5 \quad 38 = 2 \times 19$$

$$26 = 2 \times 13 \quad 39 = 3 \times 13$$

$$33 = 3 \times 11$$



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SIMPLIFICATION- PART2/ Recurring Numbers

$$1/4 = .25$$

$$1/3 = 0.33333 = 0.\overline{3}$$

$$0.\overline{32} = 0.322222...$$

$$0.\overline{32} = 0.32323232...$$

$$0.\overline{314} = 0.3141414...$$

$$0.\overline{516} = 0.51666666$$

$$\checkmark \quad \frac{1}{4} = 0.25$$

$$\checkmark \quad \frac{1}{2} = 0.5$$

$$\frac{1}{3} = 0.\overline{33333} \dots$$

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

$$x = 0.\overline{5} \quad \text{--- ①} \quad 0.\overline{35}$$

$$10x = 5.\overline{5} \quad \text{--- ②} \quad 0$$

$$\text{②} - \text{①} \rightarrow$$

$$9x = 5$$

$$x = \frac{5}{9}$$

$$0.\overline{3}$$

$$0.\overline{33333333} \dots$$



SIMPLIFICATION- PART2/ Recurring Numbers

✓ $1/4 = .25$

✓ $1/3 = 0.33333 = 0.\overline{3}$

✓ $0.\overline{32} = 0.322222...$

✓ $0.\overline{32} = 0.32323232...$

$0.\overline{314} = 0.3141414...$

$0.\overline{516} = 0.51666666$

$0.\overline{32}$

$0.3222222...$

$0.\overline{32}$

$0.32323232...$

$0.\overline{314}$

$0.314141414...$

$0.\overline{516}$

0.516666666

$x = 0.\overline{5} \quad \text{--- (1)}$

$10x = 5.\overline{5} \quad \text{--- (2)}$

$(2) - (1) \Rightarrow$

$9x = 5$

$x = \frac{5}{9}$



SIMPLIFICATION- PART2/ Recurring Numbers

$1/4 = .25$

$1/3 = 0.33333 = 0.\overline{3}$

$0.\overline{32} = 0.322222...$

$0.\overline{32} = 0.32323232...$

$0.\overline{314} = 0.3141414...$

$0.\overline{516} = 0.51666666$

$x = 0.\overline{5} \quad \text{--- (1)} \times 10$

$10x = 5.\overline{5} \quad \text{--- (2)}$

$(2) - (1)$

$9x = 5$

$x = \frac{5}{9}$

$x = 0.\overline{5} \quad \text{--- (1)}$

$10x = 5.\overline{5} \quad \text{--- (2)}$

$(2) - (1) \Rightarrow$

$9x = 5$

$x = \frac{5}{9}$

$$\begin{array}{r} 5.\overline{5} \\ - 0.5 \\ \hline 5.0 \end{array}$$



$0.\overline{5} = 0.55555...$
 $10 \times 0.\overline{5} = 5.\overline{5}$

SIMPLIFICATION- PART2

Q1. $0.\overline{403}$ write in fraction.

$$\frac{403 - 4}{990} = \frac{401}{990}$$

Q3. $1.\overline{046} = ?$

Q2. $0.\overline{5279}$ write in fraction.

$$\frac{5279 - 52}{9900} = \frac{5227}{9900}$$

Q4. $5.\overline{09} = ?$



SIMPLIFICATION- PART2

Q1. $0.\overline{403}$ write in fraction.

$$\frac{403 - 4}{990} = \frac{401}{990}$$

Q3. $1.\overline{046} = ?$

$$1 + \frac{46 - 0}{990} = 1 + \frac{46}{990}$$

Q2.  write in fraction.

$$\frac{5227}{9900} = \frac{5227}{9900}$$

Q4. $5.\overline{09} = ?$

$$5 + \frac{9 - 0}{90} = 5 + \frac{9 \cdot \frac{1}{10}}{90}$$

$$5 + 0.1 = 5.1$$

SIMPLIFICATION- PART2

Q5. $4.\overline{53} + 1.\overline{046} + 0.\overline{49} = ?$

a. $5.\overline{051}$

☒ b. $6.\overline{076}$

c. $5.\overline{081}$

d. $6.\overline{120}$

$$\begin{array}{r} 4.\overline{53} = 4.535353 \\ + 1.046464 \\ + 0.494949 \\ \hline 6.076766 \end{array}$$

$$\frac{6.076}{0}$$



SIMPLIFICATION- PART2

Q6. What is the square root of $0.\overline{4}$

(a) $0.\overline{7}$

(b) $0.\overline{8}$

☒ (c) $0.\overline{6}$

(d) $0.\overline{2}$

$$\begin{aligned} x &= 0.\overline{4} \quad \text{--- (1) } \times 10 \\ 10x &= 4.\overline{4} \quad \text{--- (2)} \\ \hline 9x &= 4 \\ x &= \frac{4}{9} \end{aligned}$$

$$20 \div 18 = 1.111\ldots$$

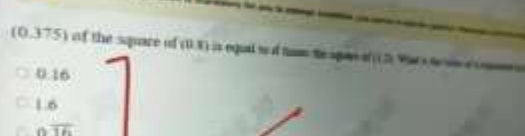
$0.\overline{4}$

$$\left(\frac{4}{9}\right) = \sqrt{\frac{4}{9}} = \frac{2}{3}$$

$$\frac{2}{3} = 0.6666\ldots = 0.\overline{6}$$



SIMPLIFICATION- PART2



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Note: This question is identifying the area to answer. Question and answer are given.

(0.375) of the square of (0.8) is equal to if from the square of (1.2). What is the ratio of 1 component to another.

Options:

- ☐ 0.16
- ☐ 1.6
- ☐ 0.16
- ☐ 0.16

Handwritten: A large red bracket is drawn around the options. A red checkmark is in the top left corner. A red line is drawn across the options. A red circle is drawn around the bottom right corner of the screen.

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SIMPLIFICATION- PART2

$$(a^x)^y = a^{x \cdot y}$$

$$((a^x)^y)^z = a^{xyz}$$

The simplest form of $\left\{ \left(\sqrt[2]{x^{-2/3}} \right)^{-2/3} \right\}^3$ is:

☐ $x^{-3/2}$
☐ $x^{3/2}$
☐ $x^{-2/3}$
☒ $x^{2/3}$

$$\left\{ \left((x^{-2/3})^{1/2} \right)^{-2/3} \right\}^3$$

$$x^{-\frac{2}{3} \times \frac{1}{2} \times -\frac{2}{3} \times 3}$$

$$x^{2/3}$$



SIMPLIFICATION- PART2

If $A = \sqrt{3} + \sqrt{2}$, $B = \sqrt{3} - \sqrt{2}$, $C = \sqrt{2} - \sqrt{3}$, then find the value of $\frac{C(A+B)}{B(A+C)}$.

- ☐ $\frac{\sqrt{2}}{\sqrt{3}}$
☐ $-\frac{\sqrt{2}}{\sqrt{3}}$
☒ $-\frac{\sqrt{3}}{\sqrt{2}}$
☐ $\frac{\sqrt{3}}{\sqrt{2}}$

$$A+B = \sqrt{3} + \sqrt{2} + \sqrt{3} - \sqrt{2} = 2\sqrt{3}$$

$$A+C = \sqrt{3} + \sqrt{2} + \sqrt{2} - \sqrt{3} = 2\sqrt{2}$$

$$\frac{(\sqrt{2}-\sqrt{3})(2\sqrt{3})}{(\sqrt{3}-\sqrt{2}) \times 2\sqrt{2}} = \frac{-(\sqrt{3}-\sqrt{2})\sqrt{3}}{(\sqrt{3}-\sqrt{2})\sqrt{2}}$$

$$-\frac{\sqrt{3}}{\sqrt{2}}$$



SIMPLIFICATION- PART2

Numerical Ability

Question No. 4

If $2\frac{1}{4} \div \left\{ 1\frac{1}{4} - x \left(\frac{3}{4} \div \frac{2}{3} \text{ of } \frac{9}{5} \right) \right\} = \frac{3}{20}$, then what is the value of x ?

☐ 16
☐ -18
☒ -22
☐ 22

$$\frac{9}{4} \div \left\{ \frac{5}{4} - x \left(\frac{3}{4} \div \frac{2}{3} \times \frac{9}{5} \right) \right\} = \frac{3}{20}$$

$$\frac{9}{4} \div \left\{ \frac{5}{4} - x \left(\frac{3}{4} \times \frac{5}{62} \right) \right\} = \frac{3}{20}$$

$$\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{5x}{8} \right\} = \frac{3}{20}$$



$$\frac{9}{4} \div \left\{ \frac{10-5x}{8} \right\} = \frac{3}{20}$$

or

$$\frac{3 \times 9}{4} \times \frac{8^2}{10-5x} = \frac{3}{20}$$

$$\frac{6}{8(2-x)} = \frac{1}{20} \times 4$$

$$2-x = 24$$

$$x = 2-24 = -22$$

$$(a^x)^y = a^{xy}$$

SIMPLIFICATION- PART2

$$a^{-3} = \frac{1}{a^3}$$

Numerical Ability
Question No. 7

If $x = \sqrt[4]{(64)^{-2}} \div \left(\frac{81}{36}\right)^{-\frac{3}{2}} \times 3^{-2}$, then \sqrt{x} is equal to

☒ $\frac{1}{8}$
☐ $\frac{1}{4}$
☐ $\frac{9}{4}$
☐ $\frac{27}{8}$

64x64

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$$\left(\frac{1}{8}\right)^{\frac{1}{4}} \times$$

$$= \left(\frac{1}{8 \times 8 \times 8 \times 8}\right)^{\frac{1}{4}} \div \left(\frac{3}{2}\right)^{-\frac{2 \times -3}{2}} \times \frac{1}{27}$$

$$\lambda = \frac{1}{8} \div \left(\frac{3}{2}\right)^{-3} \times \frac{1}{27} \quad \sqrt{x}$$

$$\frac{1}{8} \times \left(\frac{2}{3}\right)^{-3} \times \frac{1}{27} = \sqrt{\frac{1}{8} \times \frac{1}{8}}$$

$$\frac{1}{8} \times \left(\frac{3}{2}\right)^3 \times \frac{1}{27}$$

$$\lambda = \frac{1}{8} \times \frac{27}{8} \times \frac{1}{27} = \lambda = \frac{1}{8 \times 8}$$

SIMPLIFICATION- PART2

$$x^2 - 6x + 3$$

Numerical Ability
Question No. 14

If $x = \frac{1}{3-2\sqrt{2}}$, then what is the value of $(x^2 - 6x + 3)$

☒ 2
☐ 1
☐ 4
☐ 5

$$(a+b)(a-b) = a^2 - b^2$$

$$x^2 - 6x + 3$$

$$\Rightarrow (3+2\sqrt{2})^2 - 6(3+2\sqrt{2}) + 3$$

$$= \frac{9+8+12\sqrt{2}-18-12\sqrt{2}+3}{}$$

$$x = \frac{20-18}{2} = 2 \quad \checkmark$$

$$x = \frac{1}{3-2\sqrt{2}} \times \frac{3+2\sqrt{2}}{3+2\sqrt{2}}$$

$$= \frac{3+2\sqrt{2}}{(3)^2 - (2\sqrt{2})^2}$$

$$x = \frac{3+2\sqrt{2}}{9-8} = 3+2\sqrt{2}$$



SIMPLIFICATION- PART2

Numerical Ability
Question No. 21

It is given that, if $x = \sqrt[4]{6}, y = \sqrt{8}, z = \sqrt[4]{32}$, then which among the following is true?

☐ $x > y > z$
☐ $y > z > x$
☐ $z > y > x$
☐ $z > x > y$

$$\sqrt[4]{16} = 2$$

$$x = \sqrt[4]{6} =$$

$$y = \sqrt{8} = 2.828$$

$$z = \sqrt[4]{32} =$$

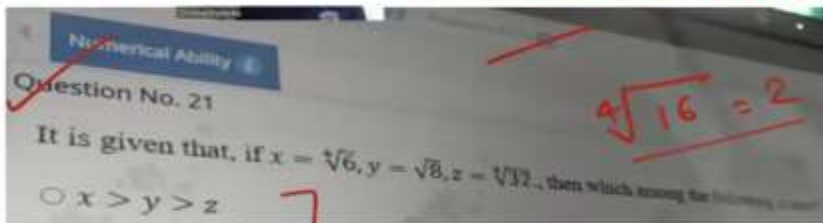
$$\sqrt[4]{16 \times 32} = 2$$

$$\sqrt{8} = \sqrt{2 \times 2 \times 2}$$

$$= 2\sqrt{2} = 2.828$$



SIMPLIFICATION- PART2



☐ $x > y > z$

☐ $y > z > x$

☐ $z > y > x$

☐ $z > x > y$

$$\sqrt[4]{16} = 2$$

$$\sqrt[4]{2 \times 2 \times 2 \times 2} = 2$$

$$\sqrt{8} = \sqrt{2 \times 2 \times 2} = 2\sqrt{2}$$

$$2.828$$



$$x = \sqrt[3]{6} = < 2$$

$$y = \sqrt{8} = 2.828$$

$$z = \sqrt[3]{32} = > 5$$

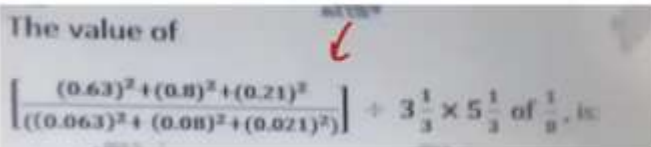
$$z > y > x$$

$$\sqrt[4]{32}$$

$$\sqrt{36} = 6$$

SIMPLIFICATION- PART2

Q.



- ☒ 15
☐ 30
☐ 45
☐ 20

$$\frac{(0.63)^2 + (0.8)^2 + (0.21)^2}{(0.063)^2 + (0.08)^2 + (0.021)^2}$$

$$\frac{(0.63)^2 + (0.8)^2 + (0.21)^2}{\left(\frac{0.63}{10}\right)^2 + \left(\frac{0.8}{10}\right)^2 + \left(\frac{0.21}{10}\right)^2}$$



$$\frac{(0.63)^2 + (0.8)^2 + (0.21)^2}{\left(\frac{1}{10}\right)^2 [(0.63)^2 + (0.8)^2 + (0.21)^2]}$$

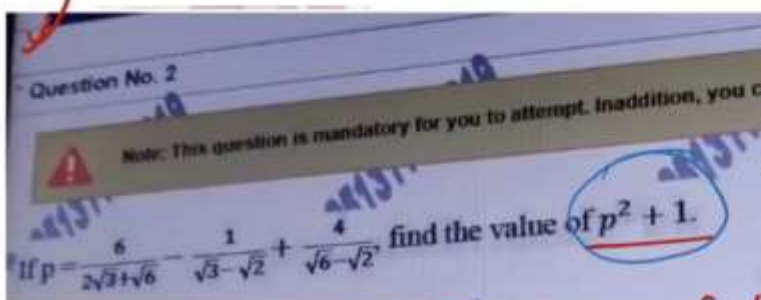
$$= 100$$

$$100 \div \frac{10}{3} \times \frac{16}{3} \times \frac{2}{3} \times \frac{1}{8}$$

$$\frac{20}{10} \times \frac{2}{3} \times \frac{2}{3}$$

$$20$$

SIMPLIFICATION- PART2



- a. 3
b. 5
c. 4
d. 2

$$p = \frac{6}{2\sqrt{3}+\sqrt{6}} - \frac{1}{\sqrt{3}-\sqrt{2}} + \frac{4}{\sqrt{6}-\sqrt{2}}$$

$$p = \frac{6(2\sqrt{3}-\sqrt{6})}{6} - \frac{\sqrt{3}+\sqrt{2}}{1} + \frac{4(\sqrt{6}+\sqrt{2})}{4}$$

$$p = 2\sqrt{3} - \sqrt{6} - \sqrt{3} - \sqrt{2} + \sqrt{6} + \sqrt{2}$$

$$p^2 + 1 = (\sqrt{3})^2 + 1 = 3 + 1 = 4$$

$$a^2 - b^2 = (2\sqrt{3})^2 - (\sqrt{6})^2$$

$$3 - 6 = -3$$

$$3 - 2 = 1$$

$$6 - 2 = 4$$

