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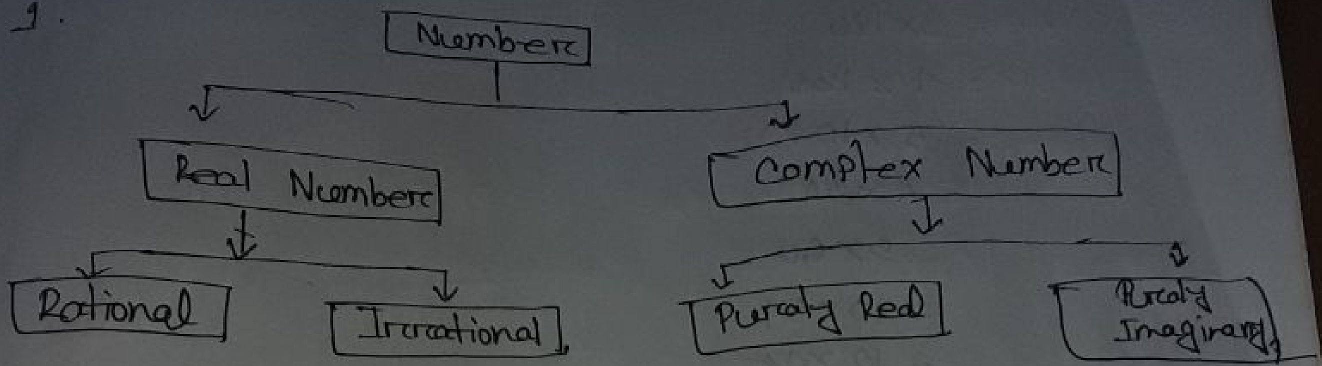
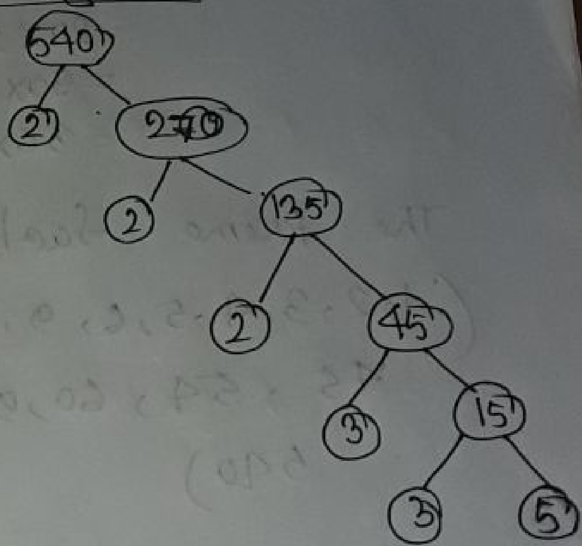
1.



2. Division Method :

2 | 540
2 | 270
2 | 135
2 | 45
3 | 15
5

Tree Diagram :



Multiplication Method :

$$540 = 2 \times 270$$
$$= 2 \times 2 \times 135$$
$$= 2^2 \times 135$$
$$= 2^2 \times 3 \times 45$$
$$= 2^2 \times 3^2 \times 15$$
$$= 2^2 \times 3^2 \times 5$$

3. $540 = 1 \times 540$
$= 2 \times 270$
$= 3 \times 180$
$= 4 \times 135$
$= 5 \times 108$
$= 6 \times 90$
$= 9 \times 60$
$= 10 \times 54$
$= 12 \times 45$
$= 15 \times 36$
$= 18 \times 30$
$= 20 \times 27$
$= 30 \times 18$
$= 36 \times 15$

The prime factors :
$(1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 30, 36, 45, 54, 60, 90, 108, 135, 180, 270, 540)$

4. $240 = 2 \times 120$
$= 2 \times 2 \times 2 \times 30$
$= 2^4 \times 3 \times 5$

$140 = 2 \times 70$
$= 2 \times 2 \times 35$
$= 2^2 \times 5 \times 7$

$L.C.M\,(240, 140) = 2^4 \cdot 3 \cdot 5 \cdot 7$
$= 1680$

$G.C.D\,(240, 140) = 2^2 \cdot 5$
$= 4 \cdot 5$
$= 20$

5. $42 = 2\times21 = 2\cdot3\cdot7$

$63 = 3\times21 = 3\cdot3\cdot7 = 3^2\cdot7$

$140 = 2\times70 = 2\cdot2\cdot5\cdot7 = 2^2\cdot5\cdot7$

LCM $(42, 63, 140) = 2^2\cdot3^2\cdot5\cdot7 = 1260$

HCF $(42, 63, 140) = 7$

6. ~~R~~ Calculation of number:

$2 = 2^1$

$8 = 2^3$

$16 = 2^4$

$10 = 2\cdot5$

$\therefore$ LCM $= 2^4\cdot5$

HCF $= 2$

Calculation of number:

$3 = 3^1$

$9 = 3^2$

$81 = 3^4$

$27 = 3^3$

LCM $= 3^4$

HCF $= 3$

LCM of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$

$$= \frac{\text{LCM of }(2, 8, 16, 10)}{\text{GCD of }(3, 9, 82, 27)}$$

$$= \frac{2^4\cdot5}{3}$$

HCF of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$

$$= \frac{\text{GCD of }(2, 8, 16, 10)}{\text{LCM of }(3, 9, 81, 27)}$$

$$= \frac{2}{3^4}$$ Ans.

7. $Z = \dfrac{1+\sqrt{3}i}{1-\sqrt{3}i}$

Notation $= |z|$

Rule $|z| = \sqrt{x^2+y^2}$

Suppose,

$z_1 = 1+\sqrt{3}i$ and $z_2 = 1-\sqrt{3}i$

$|z_1| = \sqrt{(1)^2+(\sqrt{3})^2} = \sqrt{4} = 2$

$|z_2| = \sqrt{(1)^2+(-\sqrt{3})^2} = \sqrt{4} = 2$

$\therefore$ Modulas of $|z| = \dfrac{2}{2} = 1$ Ans

And

Z_1's Argument is $\theta_1 = \tan^{-1}\dfrac{y}{x}$

$= \tan^{-1}\sqrt{3}$

$= 60^\circ$

Z_2's Argument is $\theta_2 = 360^\circ - \tan^{-1}\dfrac{y}{x}$

$= 360^\circ - \tan^{-1}\sqrt{3}$

$= 300^\circ$