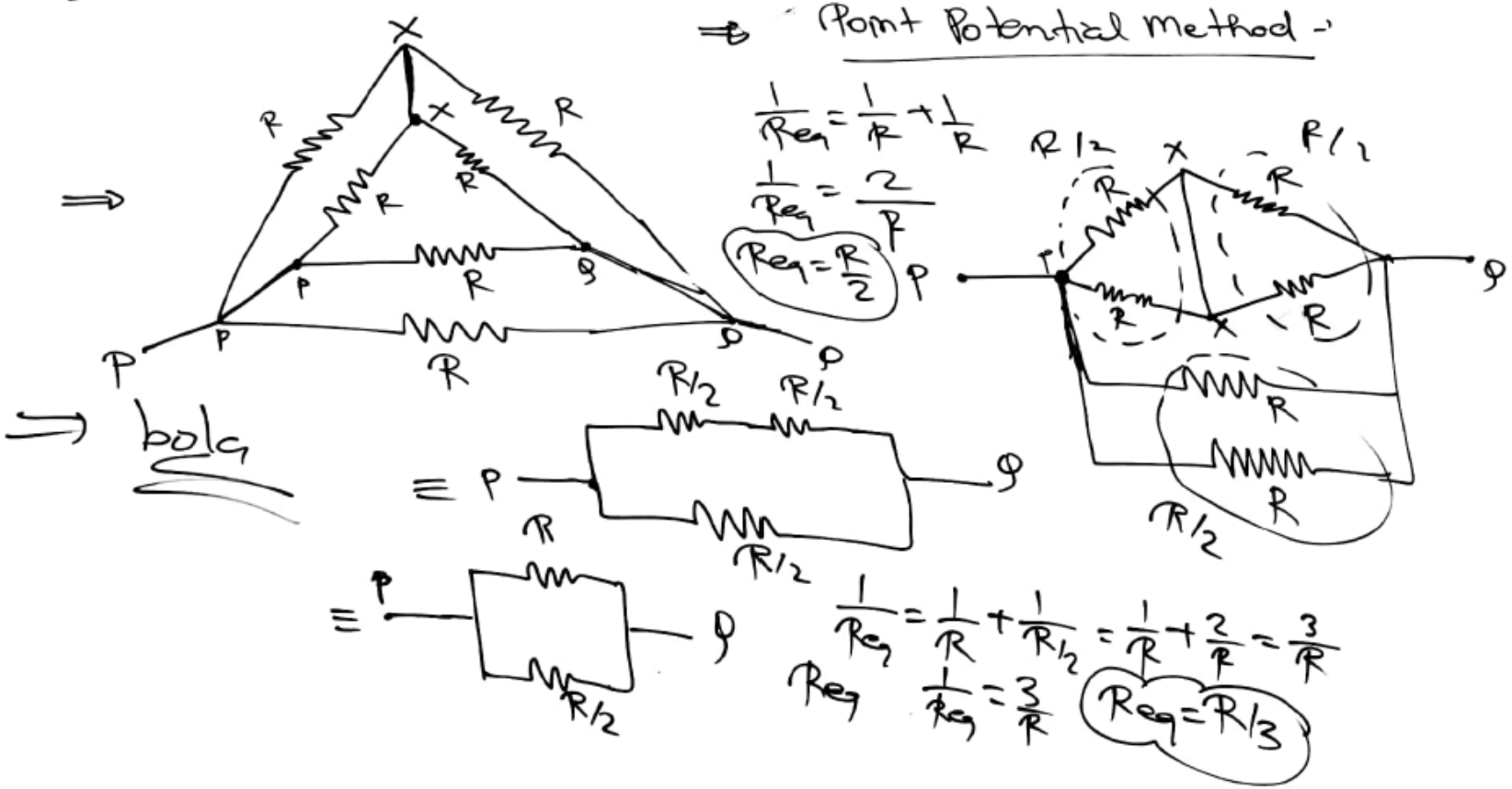
Find Equivalent resistance b/w P and Q.

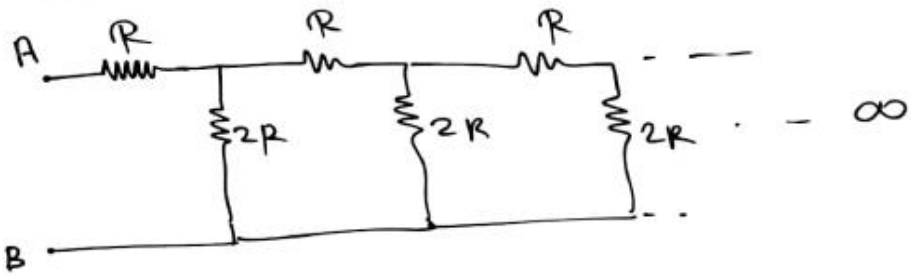
⇒ Point Potential Method :-



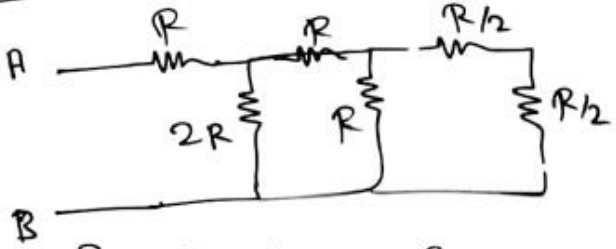
⇒ bola

Ladder problem:

Find Req b/w A & B



Q)



Find Req b/w A & B

$$\frac{1}{R_{eq}} = \frac{1}{2R} + \frac{1}{\frac{3R}{2}}$$

$$\frac{1}{R_{eq}} = \frac{1}{2R} + \frac{2}{3R}$$

$$\frac{1}{R_{eq}} = \frac{3R+4R}{6R^2} = \frac{7R}{6R^2}$$

$$R_{eq} = \frac{6R}{7}$$

$$\frac{1}{R_{eq}} = \frac{1}{R} + \frac{1}{R} = \frac{2}{R}$$

$$R_{eq} = \frac{R}{2}$$

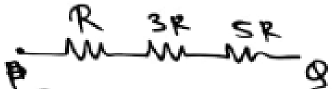
=

=

=

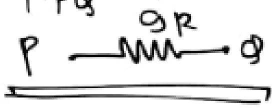
$$R_{eq} = R + \frac{6R}{7} = \frac{13R}{7}$$

(1)

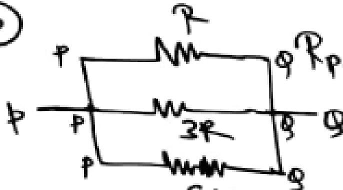


find R_{eq} b/w PQ is

$R_{PQ} = R + 3R + 5R = 9R$



(b)

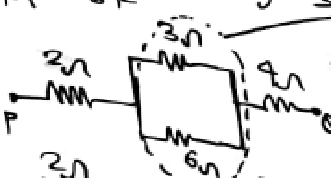


$R_{PQ} = ?$

$$\frac{1}{R_{eq}} = \frac{1}{R} + \frac{1}{3R} + \frac{1}{6R} = \frac{6+2+1}{6R}$$

$$\frac{1}{R_{eq}} = \frac{9}{6R} \quad R_{eq} = \frac{6R}{9} = \frac{2R}{3}$$

(c)

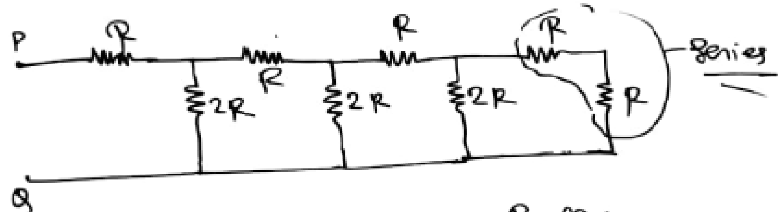


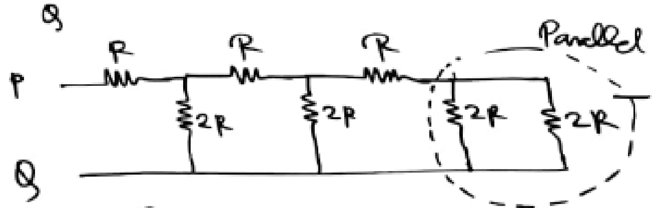
$R_{PQ} = ?$

$$R_{eq} = \frac{R_1 R_2}{R_1 + R_2} = \frac{3 \times 6}{9} = 2\Omega$$

$R_{PQ} = 8\Omega$

(#)





$$\frac{1}{R_{eq}} = \frac{1}{2R} + \frac{1}{2R} = \frac{1+1}{2R} = \frac{2}{2R}$$

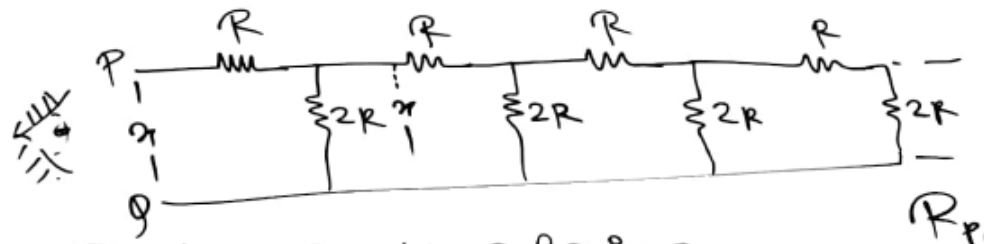
$R_{eq} = R$

$R_{eq} = R$

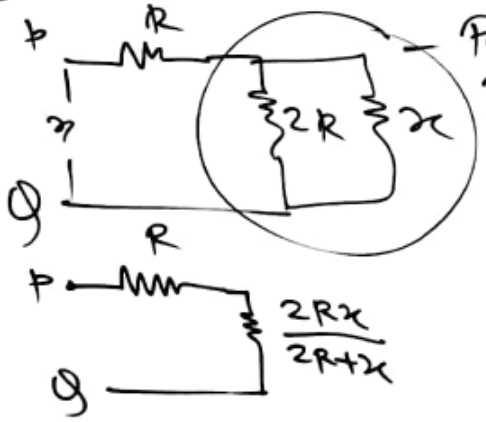
Parallel $\Rightarrow$ $R_{eq} = R$

$R_{PQ} = 2R$

Ladder problem: find Req b/w P & Q



Sol: (1) Let Req b/w P & Q is x.



$$R_{PQ} = R + \frac{2Rx}{2R+x}$$

$$x = R + \frac{2Rx}{2R+x}$$

$$(x - R) = \frac{2Rx}{2R+x}$$

$$(x-R)(2R+x) = 2Rx$$

$$\Rightarrow 2Rx + x^2 - 2R^2 - xR = 2Rx$$

$$x^2 - xR - 2R^2 = 0$$

$$x^2 - 2xR + xR - 2R^2 = 0$$

$$x(x-2R) R (x-2R) = 0$$

$$(x-2R)(x+R) = 0$$

$x = 2R$ $\quad x = -R$ ✗