Date

(ii) Strains

Deformed Coordinate System	Undeformed Coordinate System
$x_1 = 2X_1$	X_1
$y_1 = 2Y_1$	Y_1

→ displacement in x_1 dir

u_1 = deformed − undeformed =

$u_1 = x_1 - X_1 = x_1$

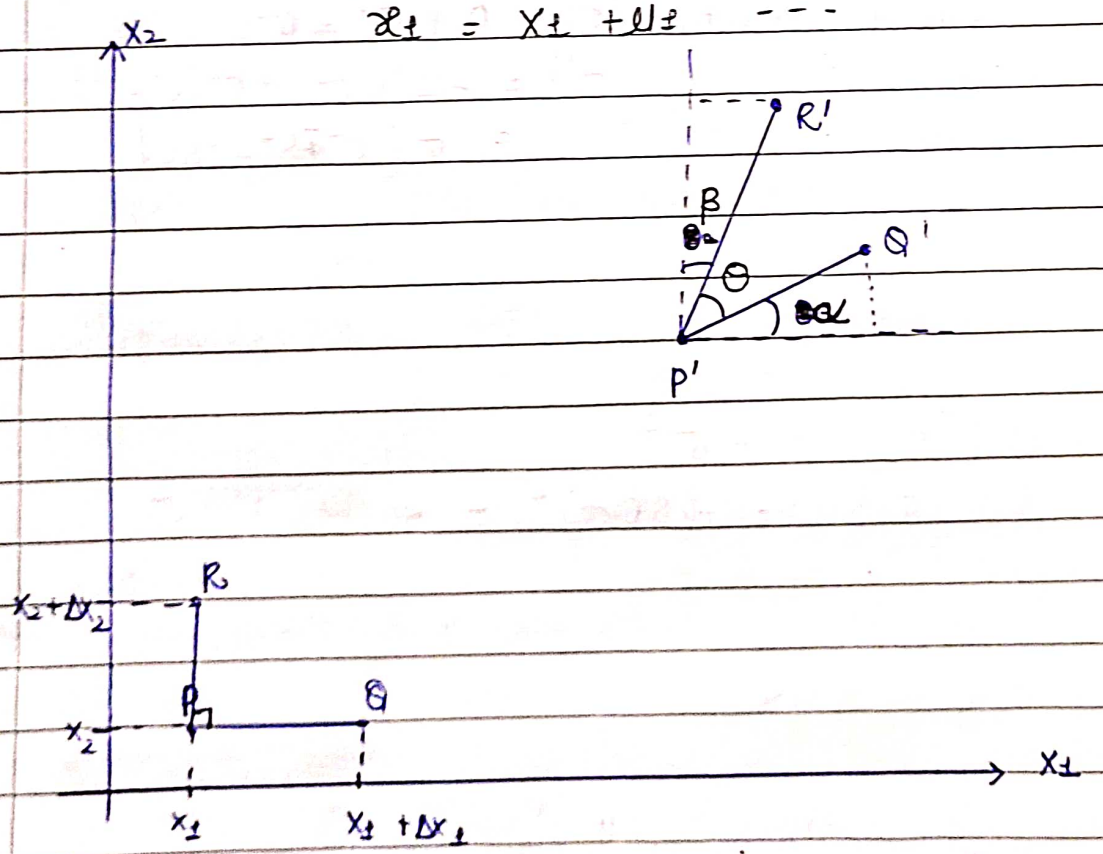
$u_2 = x_2 - X_2 = X_2$

→ displacement in x_2 dir.

or

u_1 ⟶ amount by which we have to travel to reach at x_1

$x_1 = X_1 + u_1$ ---



$P'(x_1 + u_1, x_2 + u_2)$

If there is no gradient of displacement then length of PQ must be same as of P'Q' but that isn't the case here so some gradient of u_1 & u_2 along x_1 & x_2 #du x/n