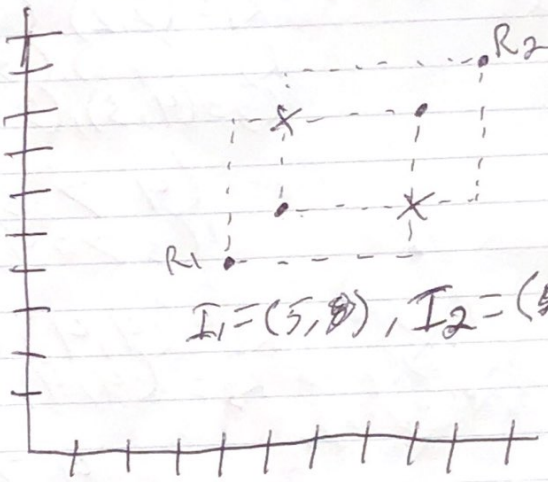


$I_1 = (5, 8)$, $I_2 = (8, 5)$

$R_1 = (4,4), (8,8)$ $\quad R_2 = (5,5), (9,9)$

$x_1\ y_1 \quad x_2\ y_2 \quad x_3\ y_3 \quad x_4\ y_4$

$x_5 = 5 = \max(4,5)$
$y_5 = 5 = \max(4,5)$
$x_6 = 8 = \min(8,9)$
$y_6 = 8 = \min(8,9)$

$I_1 = x_5, y$

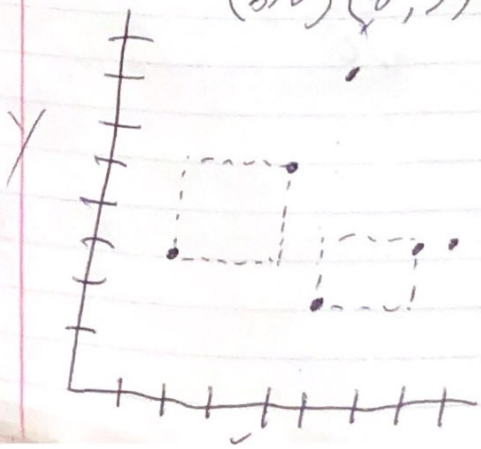
$R_3 = (5,5), (8,8)$
$x_5\ y_5 \quad x_6\ y_6$

$I_1 = (5,8)$
$I_2 = (8,5)$

Intersect

$5 > 8 = No$
$5 > 8 = No$

(5,8) (8,3)



$R_1 = (2,3), (4,5)$
$R_2 = (5,2), (7,3)$
$R_3 = (5,7), (2,3)$

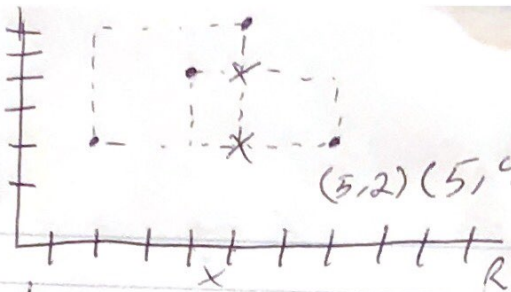
$x_5 > x_6$
$y_5 > y_6$

$5 > 2 = Yes$
$7 > 3 = Yes$

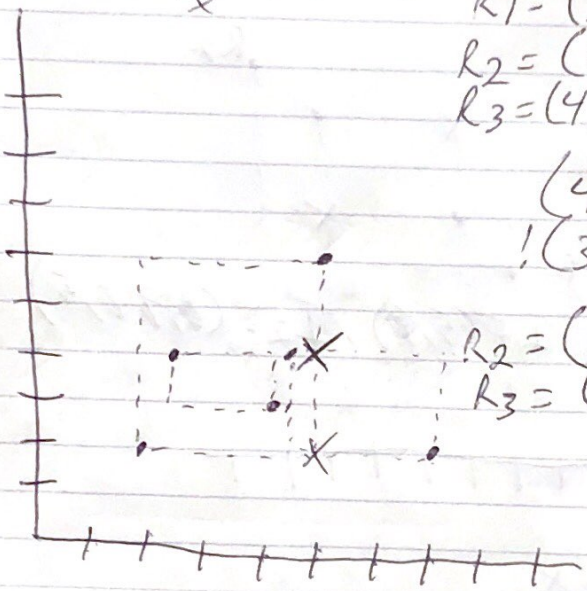
No Intersect

$x_1\ 5$
$y_1\ 3$
$x_2\ 4$

$5 = \max(2,5)$
$7 = \max(4,7)$
$2 = \min(3,2)$
$3 = \min(5,3)$



$R_1 = (2,2)(5,6)$
$R_2 = (4,4)(7,2)$
$R_3 = (4,4),(5,2)$



$R_1 = (2,2),(5,6)$
$R_2 = (4,3),(3,4)$
$R_3 = (4,3),(3,4)$

$(4 >= 3)$ yes
$!(3 >= 4)$ NO

$R_2 = (4,4),(7,2)$
$R_3 = (4,4),(5,2)$

$4 >= 5$ N
$4 >= 2$ Y

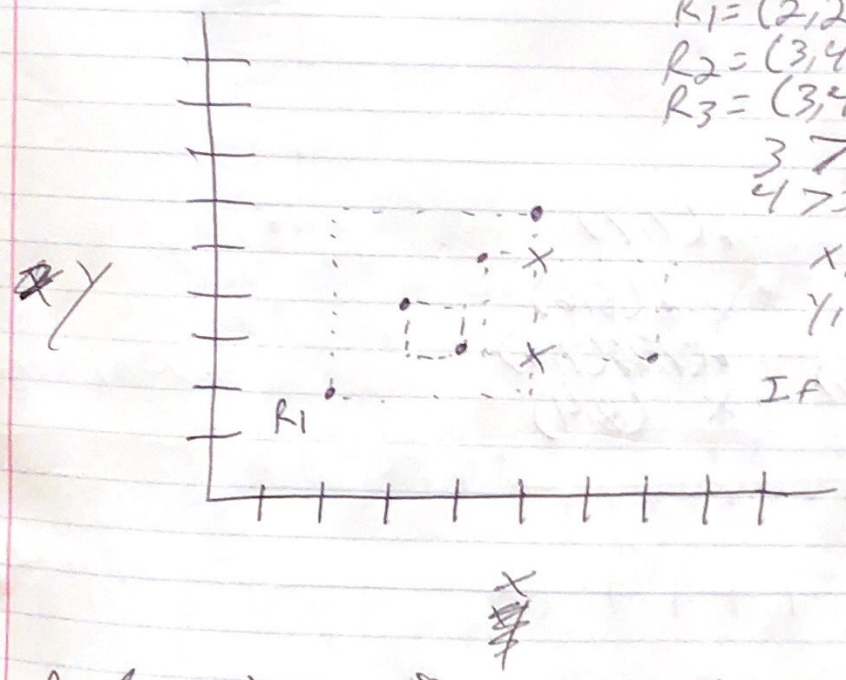
$R_1 = (2,2),(5,6)$
$R_2 = (3,4),(4,3)$
$R_3 = (3,4),(4,3)$

$\max(2,3) = 3$
$\max(4,4) = 4$
$\min(5,4) = 4$
$\min(6,3) = 3$

$3 > 4$: NO
$4 > 3$: yes

$!(x_5 >= x_6)$ containment
$!(y_5 >= y_6)$

$4 > 3$	yes
$3 > 4$	NO



$R_1 = (2,2), (5,6)$
$R_2 = (3,4), (4,3)$
$R_3 = (3,4), (4,3)$

$3 \geq 4$ NO
$4 \geq 3$ YES

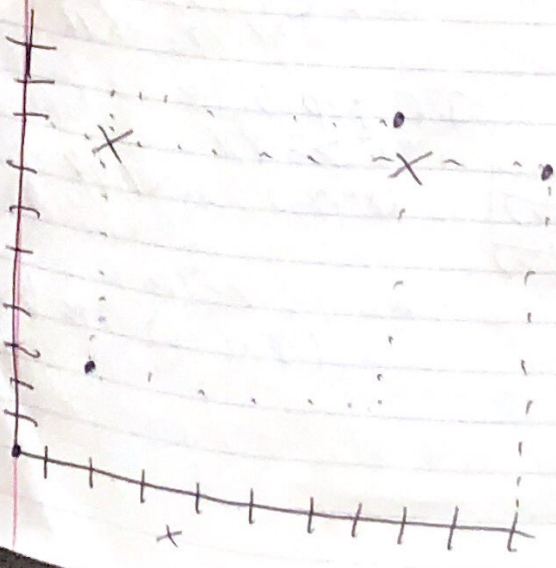
$x_1 \geq x_2$ NO
$y_1 \geq y_2$ YES

IF #R1x2

$R_1 = (2,2), (5,6)$
$R_2 = (4,5), (7,3)$
$R_3 = (4,5), (5,3)$

$4 < 5$

$R_1 = (2,2)$ (x_1, y_1), $(5,6)$ (x_2, y_2)
$R_2 = (4,3), (7,5)$
$R_3 = (4,3), (5,5)$
$I_1 = (4,5), (5,3)$



$R_1 = (0,0), (10,8)$
$R_2 = (2,3), (7,9)$
$R_3 = (2,3), (7,8), (2,8)$
$I_1 = (2,8),$
$I_2 = (7,3)$

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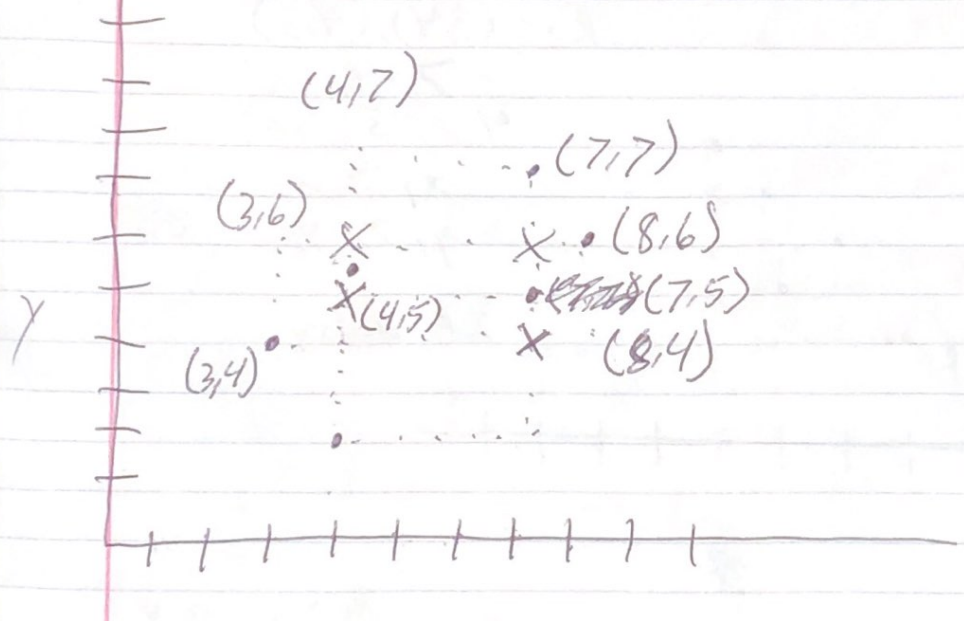


1) $R_1 = (3,4), (8,6)$
$R_2 = (4,2), (7,5)$
$R_3 = (4,4), (7,5)$

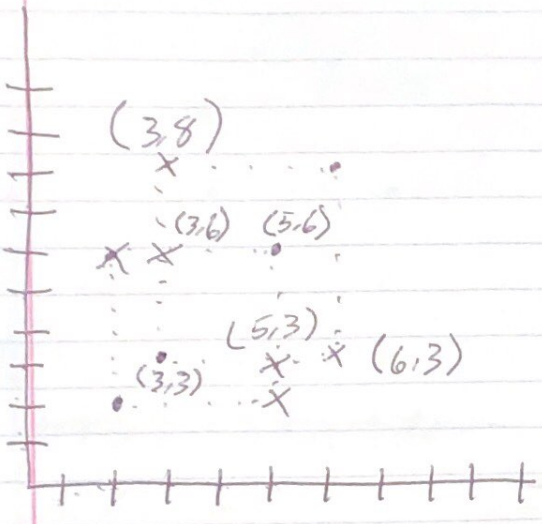
$I = (4,5), (7,4)$

$R_1 = (3,4), (8,6), (3,6), (8,4)$
$R_2 = (4,5), (7,7), (4,7), (7,5)$
$R_3 = (4,5), (7,6), (4,6), (7,5)$

2) $R_1 = (3,4), (8,6), (3,6)$
$R_2 = (4,5), (7,7)$
$R_3 = (4,5), (7,6)$
$I = (4,6), (7,5)$
$x_1\ y_1$ $x_2\ y_2$ $x_7\ y_7$ $x_8\ y_8$

If top side
$Y5 >= Y7$
$(x5, y5)$ else $x7, y8$

$Y6 >= Y8$
$(x6, y6)$ else $(x8, y8)$



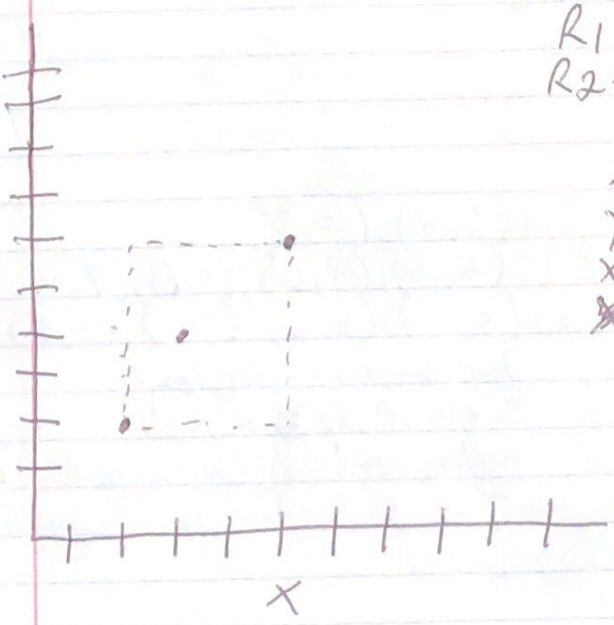
x_1, y_2 x_2, y_1

$R_1 = (2,2), (5,6)$ $\boxed{(2,6), (5,2)}$

$R_2 = (3,3), (6,8), (3,8), (6,3)$

$R_3 = \cancel{(3,3), (5,6)}, (3,6), (5,3)$

$I = (3,6), (5,3)$



$P_1\ P_1 \quad P_2\ P_2$

$R_1 = (2,2), (5,6), (2,6), (5,2)$

$R_2 = (3,4), (4,3), (3,3),$

$P_3\ P_3 \quad P_4\ P_4$

$x_1 < x_2 \rightarrow$ yes $>$ yes

$y_1 < y_2 \rightarrow$ yes

$x_3 < x_4 \rightarrow$ yes $>$

$y_3 < y_4 \rightarrow$ NO

$y_1 >$

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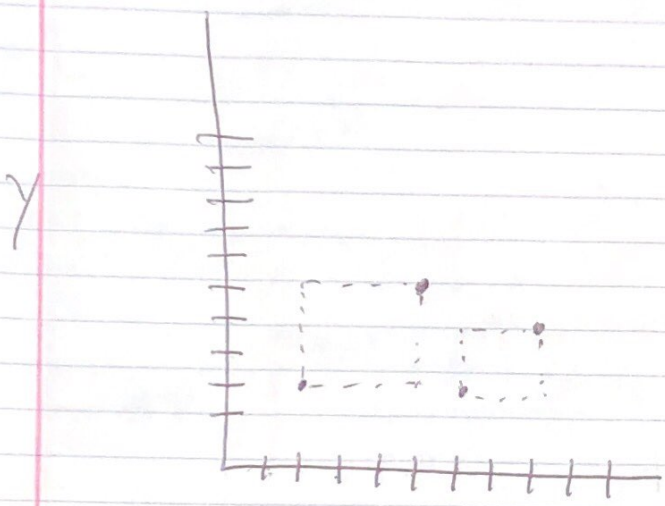


P_1 P_2 x

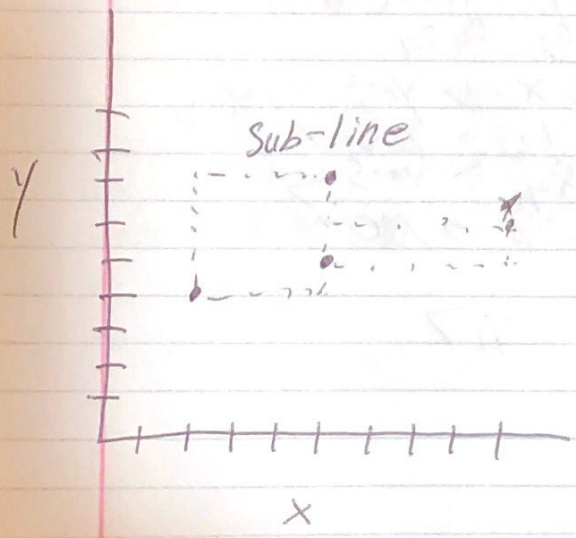
$R_1 = (2,2), (5,5)$ $P_{1y} < P_{4y}$

$R_2 = (6,2), (8,4)$

$R_3 = (6,2), (5,4)$

$6 > 5$ $x_5 > x_6$

$2 < 4$ $y_5 < y_6$



$R_1 = (2,4), (5,7)$

$R_2 = (5,5), (9,6), (5,6), (9,5)$

$R_3 = (5,5), (5,6), (5,6), (5,6)$

bottom_left = top_left

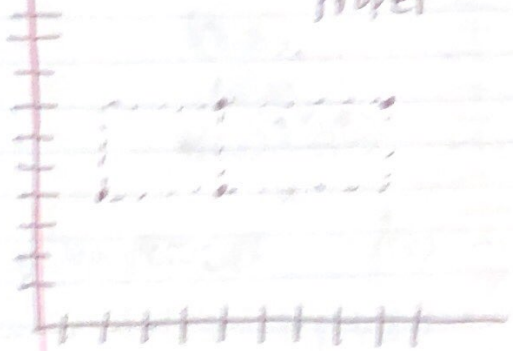
bottom_right = top_right

bottom_left = bottom_right

$R_1 = 7-4 = 3$ top_left = top_right

$R_2 = 6-5 = 1$

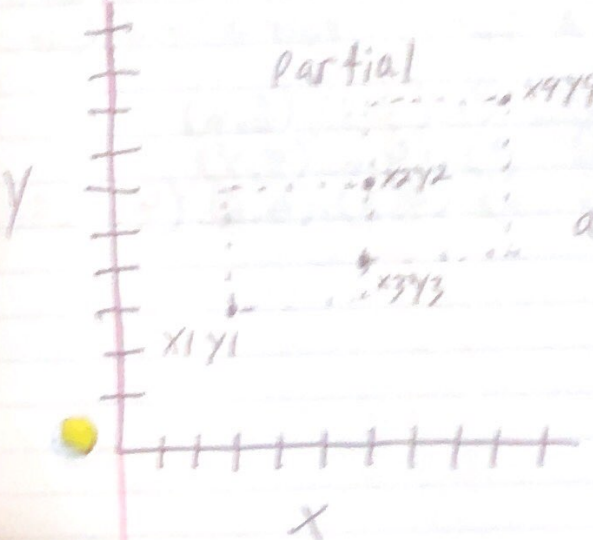
Proper



$R_1 = (2,4), (5,7), (2,7), (5,4)$
$R_2 = (5,4), (9,7), (5,7), (9,4)$
$R_3 = (5,4), (5,7), (5,7), (5,4)$

bottom-left = top-left
bottom-right = top-right
> adjacent

Partial

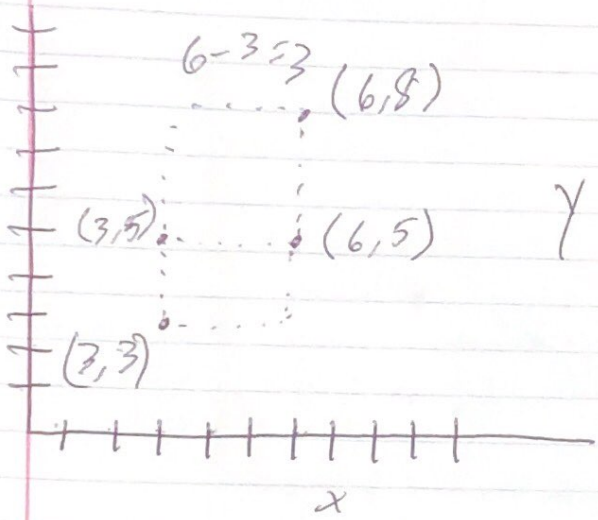


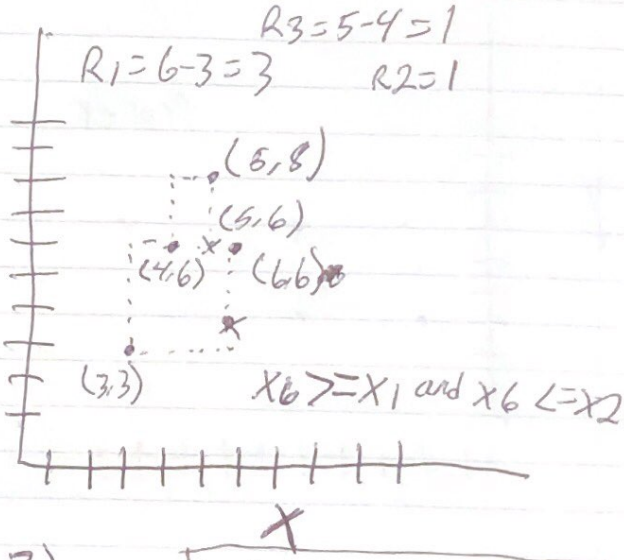
$R_1 = (3,3), (6,6), (3,6), (6,3)$
$R_2 = (6,4), (9,8), (6,8), (9,4)$
$R_3 = (6,4), (6,6), (6,6), (6,4)$

adjacent ∠ bottom-left = top-left
bottom-right = top-right

$R_1 = 6-3 = 3$
$R_2 = 8-4 = 4$
$R_3 = 6-4 = 2$

$\therefore$ $y_4 > y_2$ & $y_2 > y_3$ & $y_3 > y_1$





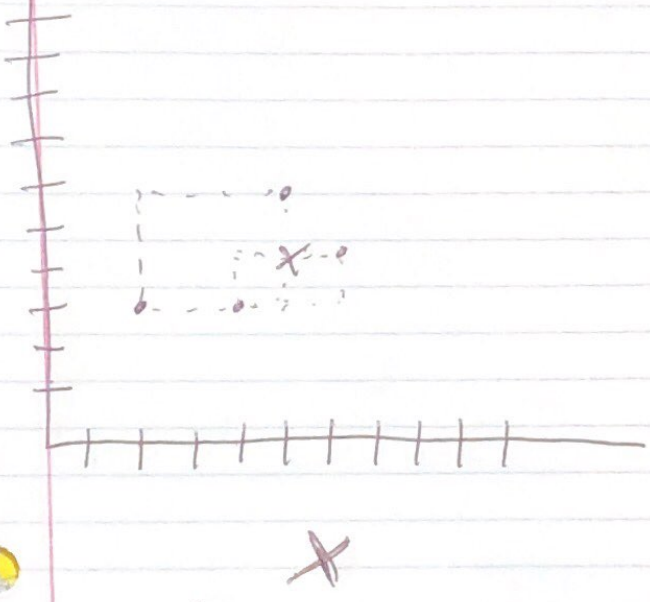
$R_1 = (3,3), (6,5), (3,5), (6,3)$
$R_2 = (3,5), (6,8), (3,8), (6,5)$
$R_3 = (3,5), (6,5), (3,5), (6,5)$

$X_3 >= X_1$ and $X_4 <= X_2$

~~bottom_left = bottom_right~~ bottom_left = top_left
~~top_left = top_right~~ bottom_right = top_right

$X_6 - X_5 = X_4 - X_3 = X_2 - X_1$ = Proper ~~Left~~ Top Bot
$Y_6 - Y_5 = Y_4 - Y_3 = Y_2 - Y_1$ = proper → left ↔ Right

~~$R_1 = (3,3), (6,6), (3,6), (6,3)$~~ $R_1 = (3,3), (6,6)$
~~$R_2 = (4,6), (5,8), (4,8), (5,6)$~~ $R_2 = (4,6), (5,8)$
~~$R_3 = (4,6), (6,6), (4,6), (6,6)$~~ $R_3 = (4,6), (5,6), (4,6), (5,6)$



$R_1 = (2,3), (5,6)$
$R_2 = (4,3), (6,4)$
$R_3 = (4,3), (5,4)$