2015 fall

given $R_x = 8$, $R_y = 7$

x_k, y_k	Decision parameter: p_1 or p_2	(x_{k+1}, y_{k+1})	dx $2x_{k+1}R_y^2$	dy $2y_{k+1}R_x^2$	
$(0,7)$	$p_{10} = R_y^2 - R_x^2 R_y + \frac{1}{4} R_x^2$ $p_{10} = (7)^2 - (8)^2 * 7 + (8)^2/4$ $p_{10} = -883 < 0$	$(1,7)$	$2*1*(7)^2 = 98$	$2*7*(8)^2 = 896$	
2. $(1,7)$	$p_1 = p_1 + 2R_y^2 x + R_y^2$ $= -383 + 98 + 49$ $= -236 < 0$	$(2,7)$	$2*2*(7)^2 = 196$	$2*7*(8)^2 = 896$	
3. $(2,7)$	$p_1 = -236 + 196 + 49 = 9 > 0$	$(3,6)$	$2*3*(7)^2 = 294$	$2*6*(8)^2 = 768$	
4. $(3,6)$	$p_1 = p_1 + 2R_y^2 x - 2R_x^2 y + R_y^2$ $= 9 + 294 - 768 + 49$ $= -416 < 0$	$(4,6)$	$2*4*(7)^2 = 392$	$2*6*(8)^2 = 768$	
5 $(4,6)$	$p_1 = p_1 + 2R_y^2 x + R_y^2$ $= -416 + 392 + 49$ $= 25 > 0$	$(5,5)$	$2*5(7)^2 = 490$	$2*5*(8)^2 = 640$	
6 $(5,5)$	$p_1 = p_1 + 2R_y^2 x - 2R_x^2 y + R_y^2$ $= 25 + 490 - 640 + 49$ $= -76 < 0$	$(6,5)$	$2*6(7)^2 = 588$	$2*5*(8)^2 = 640$	
7. $(6,5)$	$p_1 = p_1 + 2R_y^2 x + R_y^2$ $= -76 + 588 + 49$ $= 561 > 0$	$(7,4)$	$2*7(7)^2 = \underline{686}$	$2*4*(8)^2 = \underline{512}$	Hence

8.7

P_2				
(7,4)	$P_{20} = R_y^2(x+\frac{1}{2})^2 + R_x^2(y-1)^2 - R_x^2R_y^2$ $= (7)^2(7+\frac{1}{2})^2 + (8)^2(3)^2 - (8)^2(7)^2$ $= 196.25 > 0$	(7,3)	$2*7*(7)^2 = 686$	$2*3*(8)^2 = 384$
(7,3)	$P_2 = P_2 - 2R_x^2y + R_x^2$ $= 196.25 - 384 + 64$ $= -123.75 < 0$	(8,2)	$2*8*(7)^2 = 784$	$2*2*64 = 256$
(8,2)	$P_2 = P_2 + 2R_y^2x - 2R_x^2y + R_x^2$ $= -123.75 - 256 + 784 + 64$ $= 468.75 > 0$	(8,1)	$2*8*49 = 784$	$2*1*64 = 128$
(8,1)	$P_2 = \cancel{[illegible]}\ P_2 - 2R_x^2y + R_x^2$ $= 468.75 - 128 + 64$ $= 404.25 > 0$	(8,0)		

which is the value of (x_{k+1}, y_{k+1}) is (8,0).