3.) Estimated equation:

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 b_1(x) + \hat{\beta}_2 b_2(x) \Rightarrow$$

$$\hat{y} = 1 + X + (-2)(x-1)^2 \, I(x \geq 1)$$

$$\hat{y} = 1 + x - 2(x-1)^2 \, I(x \geq 1)$$

$-4x+5=0$

$4x=5$

$x=5/4$

$1+x-2(x-1)^2$

$=1+x-2(x^2-2x+1)$

$=1+x-2x^2+4x-2$

$=-2x^2+5x-1$

Thus,

$$\hat{y} = \begin{cases} 1+x \; ; \text{ for } x<1 \\ -2x^2+5x-1 \; ; \text{ for } x \geq 1 \end{cases}$$

x	$\hat{y}$
-2	-1
-1	0
0	1
1^-	2
1	2
1.5	
2	1