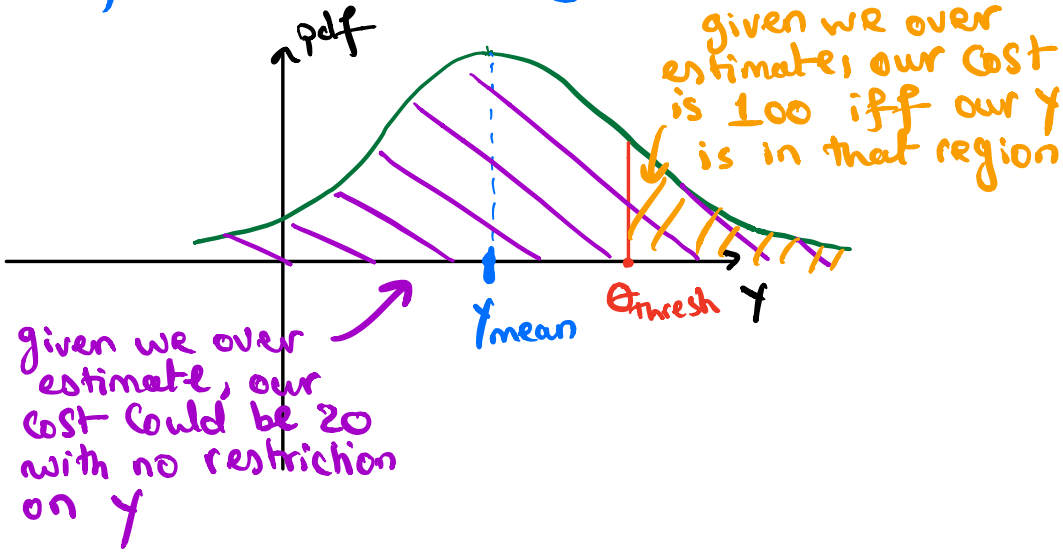
- Asymmetric cost prediction adjustment:

$$y^* = \hat{w}^T x + \sigma \Phi^{-1}\left(\frac{C_1}{C_1 + C_2}\right)$$

$C_1$ = Cost of underestimation ($C_1 = 20$ or $100$)

$C_2$ = Cost of overestimation ($C_2 = 1$)

Analysis of $C_1$ Cost: (Assuming we over estimate)




$$\rightarrow C_1 = \frac{P(y > \theta_{thresh}) \cdot 100 + 1 \cdot 20}{P(y > \theta_{thresh}) + 1}$$

where $P(y > \theta_{thresh}) = 1 - \Phi\left(\frac{0.5 - y_{mean}}{\sigma_y}\right)$

Therefore, for each point in our test set, we calculate a different $C_1$, and adjust the prediction accordingly.