Given: $\hat{y} = [0.5 \quad -4.5 \quad -9.5]^T$ $\therefore$ $y = [0 \quad -4 \quad -9]^T$

- Find RMSE and MAE of $(y, \hat{y})$

$$RMSE = \sqrt{\frac{\sum(\hat{y} - y)^2}{n}} = \sqrt{\frac{(0.5-0)^2 + (-4.5+4)^2 + (-9.5+9)^2}{3}}$$

$$= \sqrt{\frac{(0.5)^2 + (-0.5)^2 + (-0.5)^2}{3}} = \sqrt{\frac{0.25 + 0.25 + 0.25}{3}}$$

$$= \sqrt{\frac{0.75}{3}} = \sqrt{\frac{75}{100 \times 3}} = \sqrt{\frac{1}{4}} = \frac{1}{2} = 0.5 //$$

$$MAE = \left(\frac{1}{n}\right) * \sum|\hat{y} - y| = \left(\frac{1}{3}\right) * [|0 - 0.5| + |-4 + 4.5| + |-9 + 9.5|]$$

$$= \frac{1}{3} * [0.5 + 0.5 + 0.5] = \frac{1}{3} \times 1.5 = \frac{1}{3} \times \frac{15}{10}$$

$$= \frac{1}{2} = 0.5 //$$

- Find $\|y\|_0$, $\|y\|_1$, $\|y\|_2$ and $\|y\|_\infty$

$\rightarrow \|y\|_0 = 2 //$

$\|y\|_1 = |0| + |-4| + |-9| = 0 + 4 + 9 = 13 //$

$\|y\|_2 = \sqrt{(0)^2 + (-4)^2 + (-9)^2} = \sqrt{0 + 16 + 81} = \sqrt{97} //$

$\|y\|_\infty = 9 //$