Problem 1:

1. 2

Problem 2:

1. 3

Problem 3:

$$\bar{a} = \frac{8 + 4 + 0 - 4}{4} = 2$$
$$\bar{b} = \frac{-16 - 12 - 10 + 2}{4} = -9$$

$$a_{ms} = (a_i - \bar{a}) = [6, 2, -2, -6]$$

$$b_{ms} = \left(b_i - \bar{b}\right) = [-7, -3, -1, 11]$$

$$r = \frac{\sum(a_i - \bar{a})(b_i - \bar{b})}{\sqrt{\sum(a_i - \bar{a})^2\left(b_i - \bar{b}\right)^2}} = \frac{a_{ms} * b_{ms}}{\sqrt{(a_{ms}^T a_{ms}) * (b_{ms}^T b_{ms})}}$$

$$= \frac{-112}{120}$$
$$\boldsymbol{r = -0.9333}$$

Problem 4:

1. 2 because 1 has a higher correlation with the output y