

Problem Set

Determine the least squares regression line for each set of points. Round your answer to the nearest hundredth.

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1. (3, 4), (7, 6) and (-2, -4)

$$n = 3$$

$$\Sigma x = 3 + 7 + (-2)$$

$$= 8$$

$$\Sigma y = 4 + 6 + (-4)$$

$$= 6$$

$$\Sigma x^2 = 3^2 + 7^2 + (-2)^2$$

$$= 9 + 49 + 4$$

$$= 62$$

$$\Sigma xy = (3 \cdot 4) + (7 \cdot 6) + (-2 \cdot -4)$$

$$= 12 + 42 + 8$$

$$= 62$$

$$(\Sigma x)^2 = 8^2$$

$$= 64$$

$$a = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{n\Sigma x^2 - (\Sigma x)^2}$$

$$= \frac{(3)(62) - (8)(6)}{(3)(62) - (64)}$$

$$= \frac{186 - 48}{186 - 64} = \frac{138}{122}$$

$$a \approx 1.13$$

$$b = \frac{(\Sigma y)(\Sigma x^2) - (\Sigma x)(\Sigma xy)}{n\Sigma x^2 - (\Sigma x)^2}$$

$$= \frac{(6)(62) - (8)(62)}{(3)(62) - (64)}$$

$$= \frac{372 - 496}{186 - 64} = \frac{-124}{122}$$

$$b \approx -1.02$$

The least squares regression line for the points is $y = 1.13x - 1.02$.

2. (-7, 1), (3, 8) and (9, 7)

Name _____ Date _____

3. $(-3, 6)$, $(-2, -1)$ and $(6, -4)$

4. $(-8, 7)$, $(-5, 3)$, $(3, 6)$ and $(9, 0)$

5. $(-7, -1)$, $(-5, -9)$, $(3, 3)$ and $(6, 9)$

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6. $(-8, 6)$, $(-8, -2)$, $(-6, -9)$ and $(-5, -4)$