(a)

$$\bar{x} = \frac{1}{5}(1+2+1.6+3.1+2.2) = 1.98$$

$$\bar{y} = \frac{1}{5}(3+4.5+3.1+9.5+2.2) = 4.46$$

$$\sum_{i=1}^{5}(x_i-\bar{x})(y_i-\bar{y}) = (1-1.98)(3-4.46)+(2-1.98)(4.5-4.46)+\dots+(2.2-1.98)(2.2-4.46)$$

$$= 1.4308+0.0008+0.5168+5.6448+(-0.4972) = 7.096$$

$$\sum_{i=1}^{5}(x_i-\bar{x})^2 = (1-1.98)^2+\dots+(2.2-1.98)^2 = 2.408$$

$$\sum_{i=1}^{5}(y_i-\bar{y})^2 = (3-4.46)^2+\dots+(2.2-4.46)^2 = 34.492$$

$$r = \frac{\sum_{i=1}^{5}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^{5}(x_i-\bar{x})^2\sum_{i=1}^{5}(y_i-\bar{y})^2}} = \frac{7.096}{\sqrt{2.408\cdot 34.492}} \approx \boxed{0.78}$$

∴ THERE IS A STRONG POSITIVE CORRELATION BETWEEN x AND y.

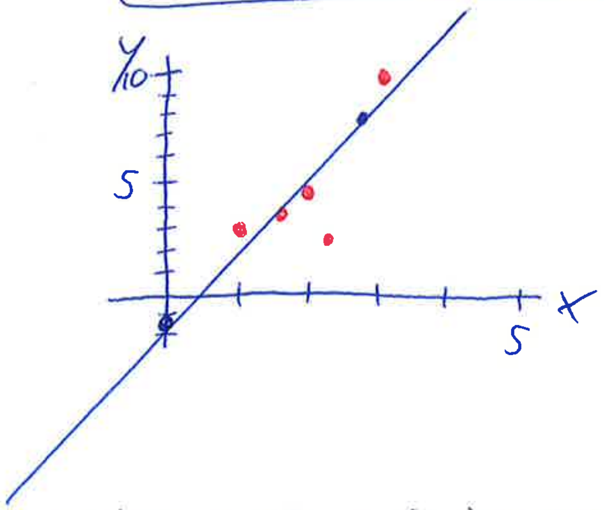
(b)

$$m = \frac{\sum_{i=1}^{5}(x_i-\bar{x})(y_i-\bar{y})}{\sum_{i=1}^{5}(x_i-\bar{x})^2} = \frac{7.096}{2.408} \approx 2.95$$

$$b = \bar{y} - m\bar{x} = 4.46 - 2.95\cdot 1.98 = -1.381 \approx -1.38$$

$$\therefore \boxed{y = 2.95x - 1.38}$$

(c)



(d) $y(0) = -1.38$, $y(20) = 2.95\cdot 20 - 1.38 = 57.62$, $y(-5) = 2.95(-5) - 1.38 = -16.13$