(a) I expect a correlation between the variables X and Y, since I expect the number of lung cancer deaths per 10,000 inhabitants to increase as the number of cigarettes sold per year increases.
The correlation between X and Y can be proven by calculating the covariance:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i = 27.135$$

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y_i = 20.891$$

$$\sigma_{XY} = \frac{1}{n}\sum_{i=1}^{n} x_i y_i - \bar{x}\bar{y} = 23.093$$

Where x_i and y_i are the absolute frequences and $\bar{x}, \bar{y}$ are the means.
Since the covariance is greater than 0, there is a correlation between X and Y. In particular, y tends to increase as x increases.

(b) The regression line $y = ax + b$ can be calculated as follows:

$$\sigma_x^2 = \frac{1}{n}\sum_{i=1}^{n} x_i^2 - \bar{x}^2 = 40.927$$

$$a = \frac{\sigma_{XY}}{\sigma_x^2} = 0.564$$

$$b = \bar{y} - \frac{\sigma_{XY}}{\sigma_x^2}\bar{x} = 5.580$$

So the regression line is:

$$y = 0.564x + 5.580$$

Graph: