11 $y = ax + b$

$$\begin{cases} a = \dfrac{\sum x_i y_i - n\bar{x}\bar{y}}{\sum x_i^2 - n\bar{x}^2} \\ b = \bar{y} - a\bar{x} \end{cases}$$

$\bar{x} = 7$ $\qquad \sum x_i y_i = 364$

$\bar{y} = 5$ $\qquad \sum x_i^2 = 524$

Więc

$a = \frac{2}{11}$, $b = \frac{6}{11}$

Ostatecznie

$y = \frac{2}{11}x + \frac{6}{11}$

13 $m_X(t) = \frac{e^t + e^{-t} + 4}{6}$

$$m_X(t) = E(e^{tX}) = 1 + tE(X) + \frac{t^2}{2!}E(X^2) + \frac{t^3}{3!}E(X^3) + \ldots = \sum_{k=0}^{\infty} \frac{t^k}{k!} E[X^k]$$

$$E(X^k) = \frac{d^k m_X(0)}{dt^k}$$

$$\frac{d^k m_X(t)}{dt^k} = \begin{cases} \frac{1}{6}(e^t - e^{-t}) & \text{dla } 2 \nmid k \\ \frac{1}{6}(e^t + e^{-t}) & \text{dla } 2 \mid k \end{cases}$$

Więc

$$E(X^k) = \begin{cases} 0 & \text{dla } 2 \nmid k \\ \frac{1}{3} & \text{dla } 2 \mid k \end{cases}$$