1. (a) Find the best fit line $y = mx + b$ for the data points

x	1	1.5	2	3	3.1	3.2	4
y	8	9	15	10	18	23	19

   (b) Use the site `https://www.socscistatistics.com/tests/regression/` to find the least squares regression line for this data. Compare your answer to part (a).

2. Let $A = \begin{bmatrix} 1 & -18 \\ -3 & 4 \end{bmatrix}$, $\vec{\mathbf{v_1}} = \begin{bmatrix} -2 \\ 1 \end{bmatrix}$, $\vec{\mathbf{v_2}} = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$, $\lambda_1 = 10,\ \lambda_2 = -5$

   (a) Show that A has eigenvalues λ_1, λ_2 with corresponding eigenvectors $\vec{\mathbf{v_1}}, \vec{\mathbf{v_2}}$

   (b) Let $P = [\vec{\mathbf{v_1}}\ \vec{\mathbf{v_2}}]$, the 2×2 matrix with columns $\vec{\mathbf{v_1}}$ and $\vec{\mathbf{v_2}}$. Compute AP

   (c) Let D be the 2×2 diagonal matrix with λ_1 and λ_2 on the diagonal. Compute PD

   (d) Compute PDP^{-1}. Ponder