Circle True or False. (1 point for correct answer, 0 if incorrect)

1. True    False    If two vectors are perpendicular to each other (they form an angle of 90°), then their dot product is 0.

2. True    False    If we find two different solutions to $A\vec{x} = \vec{b}$, then $|A| = 0$.

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points)  (a) (2 points) Let $A = \begin{pmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 1 & 1 \end{pmatrix}$ and $\vec{v} = \begin{pmatrix} 3 \\ 0 \\ 1 \end{pmatrix}$. Calculate $A\vec{v}$.

(b) (6 points) Calculate $A^{-1}$ using Gaussian elimination.

(c) (2 points) Find $\vec{x}$ such that $A\vec{x} = \vec{v}$. (Hint: Use your answer from above)