## Exam 2, 10:10am

Linear Algebra, Dave Bayer, November 10, 2022

Name:	Uni:						
	[1]	[2]	[3]	[4]	[5]	Total	

If you need more that one page for a problem, clearly indicate on each page where to look next for your work.

[1] By least squares, find the equation of the form y = ax + b that best fits the data

$\int x_1$	y1		<b>□</b> −1	0]
$x_2$	$y_2$		0	1
$  \chi_3  $	y <sub>3</sub>	_	1	1
$\begin{bmatrix} x_4 \end{bmatrix}$	y4 _		2	2

[2] Find the determinant of the matrix

 $) \bigcirc$ 

$$A = \begin{bmatrix} 1 & 0 & 2 & 3 \\ 1 & 0 & 1 & 1 \\ 5 & 5 & 5 & 5 \\ 0 & 0 & 3 & 4 \end{bmatrix}$$



[3] Find the inverse of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 1 \\ 0 & 3 & 4 \end{bmatrix}$$



[4] Find the 3 × 3 matrix A that projects  $R^3$  orthogonally onto the hyperplane x + y + 2z = 0, with respect to the usual inner product.



[5] Find the 3  $\times$  3 matrix A that projects R<sup>3</sup> orthogonally onto the hyperplane x + y + z = 0, with respect to the inner product

$$<(a, b, c), (r, s, t) > = [a b c] \begin{bmatrix} 1 & 1 & 0 \\ 1 & 3 & 1 \\ 0 & 1 & 1 \end{bmatrix} \begin{bmatrix} r \\ s \\ t \end{bmatrix}$$