

This is a two-stage quiz. You will receive this back with each question graded pass/fail in our next class meeting. You have until the date specified above to submit corrections for partial credit.

1. (5 points) Compute the determinant of

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

$$\begin{bmatrix} + & - & + \\ - & + & - \\ + & - & + \end{bmatrix}$$

$$\det(A) = \begin{vmatrix} 4 & 1 & 2 \\ 4 & 0 & 3 \\ 3 & -2 & 5 \end{vmatrix} = -1 \begin{vmatrix} 4 & 3 \\ 3 & 5 \end{vmatrix} + 0 \begin{vmatrix} 4 & 2 \\ 3 & 5 \end{vmatrix} + 2 \begin{vmatrix} 4 & 2 \\ 4 & 3 \end{vmatrix}$$

$$\begin{bmatrix} \boxed{4} & | & \boxed{2} \\ \boxed{4} & \circ & \boxed{3} \\ \boxed{3} & - & \boxed{5} \end{bmatrix}$$

$$= -1(11) + 0 + 2(4) = 8 - 11 = \boxed{-3}$$

2. (5 points) Compute the determinant of

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

$$|A| = \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ -1 & 0 & 5 & 3 \\ 3 & -3 & -2 & 3 \end{vmatrix} = \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & -1 & 2 & 3 \\ 0 & 0 & 7 & 3 \end{vmatrix}$$

- Recall row-replacement does not affect the value of the determinant.

- We need know scaling or interchange here.

$$= \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 7 & 7 \\ 0 & 0 & 7 & 3 \end{vmatrix} = \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 7 & 7 \\ 0 & 0 & 0 & -4 \end{vmatrix}$$

deter. of triangular matrix

$$= (1)(1)(7)(-4)$$

$$= \boxed{-28}$$