Math 1553, Quiz 6 (3.5-3.6 and Ch. 4), Fall 2026, Version A

Name (ALL CAPS)	Key	GT ID		Section	

Please write your name in ALL CAPS. For questions with bubbles, either fill in the bubble completely or leave it blank. **Do not** mark any bubble with "X" or "/" or any such intermediate marking. Anything other than a blank or filled bubble will be given a score of zero.

1. (1 point) Suppose A is an 3×3 matrix that is invertible. Then the last column of the RREF of A must be $\begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$.

$A \sim I_3 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ if A is invertible

● TRUE ○ FALSE

2. (1 points) Find the value of a so that $a \cdot \det \underbrace{\begin{pmatrix} 3 & 6 & 9 \\ 1 & 0 & 1 \\ 2 & 2 & 3 \end{pmatrix}}_{A} = \det \underbrace{\begin{pmatrix} 1 & 2 & 3 \\ 2 & 0 & 2 \\ 2 & 2 & 3 \end{pmatrix}}_{B}$. Clearly fill in the bubble for the correct answer below.

○ $a = 3$ ○ $a = -3$ ○ $a = 6$ ○ $a = -6$ ● $a = \frac{2}{3}$

○ $a = \frac{3}{2}$ ○ $a = 0$ ○ $a = 2$ ○ none of these

$A \sim \begin{matrix} \frac{1}{3}R_1 \to \\ 2R_2 \to \end{matrix} B$ So $\det A * \frac{1}{3} * 2 = \det B$ $a = 2/3$ ✓

alt method:

$\det A = 3\begin{vmatrix} 0 & 1 \\ 2 & 3 \end{vmatrix} - \begin{vmatrix} 6 & 9 \\ 2 & 3 \end{vmatrix} + 2\begin{vmatrix} 6 & 9 \\ 0 & 1 \end{vmatrix} = -6 - 0 + 12 = 6$

and $\det B = \begin{vmatrix} 0 & 2 \\ 2 & 3 \end{vmatrix} - 2\begin{vmatrix} 2 & 3 \\ 2 & 3 \end{vmatrix} + 2\begin{vmatrix} 2 & 3 \\ 0 & 2 \end{vmatrix} = -4 - 0 + 8 = 4$

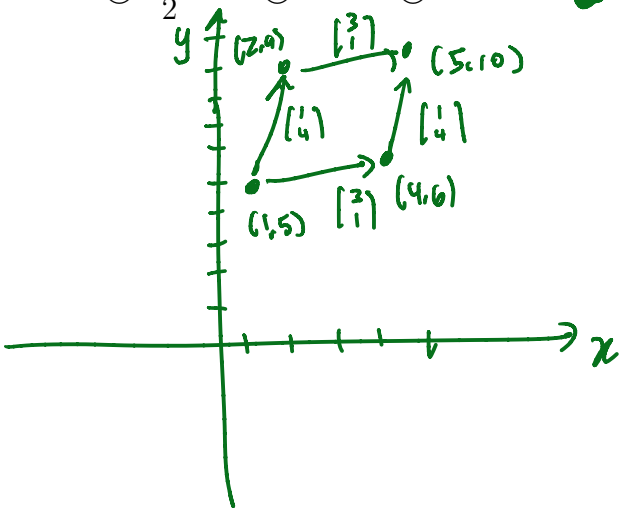
and $\frac{2}{3} * 6 = 4$ ✓

3. (1 point) Find the area of the parallelogram with vertices

$$(1,5), \quad (4,6), \quad (2,9), \quad (5,10).$$

Clearly fill in the bubble for the correct answer below.

○ $\frac{11}{2}$ ○ 6 ○ -11 ● 11 ○ 12 ○ 14 ○ none of these



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

Area $\mathcal{P} = |\det A| = \left|\det \begin{bmatrix} 1 & 3 \\ 4 & 1 \end{bmatrix}\right|$

$= |1 - 12|$

$= |-11| = 11$ ✓