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**SM 261 – Matrix Algebra – Quiz 14**  
**Section 3.2 – Properties of Determinants**

1. Find the determinant of the matrix on the right. Hint: Reduce matrix to upper triangular form using row operations.

1	1	6	8	
2	4	19	20	$R_2 - 2R_1$
3	3	21	25	$R_3 - 3R_1$
1	1	6	12	$R_4 - R_1$

$$\begin{bmatrix} 1 & 1 & 6 & 8 \\ 0 & 2 & 7 & 4 \\ 0 & 0 & 3 & 1 \\ 0 & 0 & 0 & 4 \end{bmatrix} \Rightarrow \text{Det}(A) = (1)(2)(3)(4) = 24$$

2. Based on your answer in 1 find the determinants of:

$$\Rightarrow \begin{bmatrix} 1 & 1 & 6 & 8 \\ 2 & 4 & 19 & 20 \\ 3 & 3 & 21 & 25 \\ 2 & 2 & 12 & 24 \end{bmatrix}$$

$$\therefore \text{Det} = 2(24) = 48$$

2 R4  
 $R_1 \leftrightarrow R_2$

$$\Rightarrow \begin{bmatrix} 2 & 4 & 19 & 20 \\ 1 & 1 & 6 & 8 \\ 3 & 3 & 21 & 25 \\ 1 & 1 & 6 & 12 \end{bmatrix}$$

$$\therefore \text{Det} = -24$$