☞ Quiz: Sections 3.1 & 3.2

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Linear Algebra
MATH 310
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Score: 10

Directions: Please answer in the space provided. No calculators. Please put all phones, etc., away.

Use any method or result discussed in class to find the following determinants.

1. $\begin{vmatrix} \frac{1}{2} & -7 \\ 3 & 6 \end{vmatrix} = \frac{1}{2}\cdot 6 - 3(-7) = 3 + 21 = \boxed{24}$

2. $\overset{R_1 \leftrightarrow R_2}{\overset{\curvearrowright}{}}$ $\overset{R_2 - 3R_1 \to R_2}{\overset{R_3 - R_1 \to R_3}{\overset{\curvearrowright}{}}}$ $\overset{R_3 - R_2 \to R_3}{\overset{\curvearrowright}{}}$

$$\begin{vmatrix} 3 & 2 & 4 \\ 1 & 0 & 3 \\ 1 & 2 & 1 \end{vmatrix} = -\begin{vmatrix} 1 & 0 & 3 \\ 3 & 2 & 4 \\ 1 & 2 & 1 \end{vmatrix} = -\begin{vmatrix} 1 & 0 & 3 \\ 0 & 2 & -5 \\ 0 & 2 & -2 \end{vmatrix} = -\begin{vmatrix} 1 & 0 & 3 \\ 0 & 2 & -5 \\ 0 & 0 & 3 \end{vmatrix} = -(1)(2)(3) = \boxed{-6}$$

3. $\overset{R_1 \leftrightarrow R_2}{\overset{\curvearrowright}{}}$

$$\begin{vmatrix} 0 & -5 & 0 & 0 & 0 \\ 3 & 0 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{vmatrix} = -\begin{vmatrix} 3 & 0 & 0 & 0 & 0 \\ 0 & -5 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{vmatrix} = -(3)(-5)(2)(5)(1) = \boxed{150}$$

4. $\begin{vmatrix} 1 & 2 & 4 & 1 & 2 \\ 2 & 4 & 3 & 0 & 1 \\ 3 & 6 & 7 & 3 & 3 \\ 4 & 8 & 7 & 5 & 3 \\ 5 & 10 & 5 & 6 & 1 \end{vmatrix} = \boxed{0}$ (because 2nd column is a multiple of 1st)

5. $\begin{vmatrix} 9 & 3 & 7 & 1 & 2 \\ 3 & 4 & 3 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 \\ 4 & 8 & 7 & 5 & 3 \\ 5 & 10 & 5 & 6 & 1 \end{vmatrix} = \boxed{0}$ (because 3rd row is all 0's)