

Subject: Session 6 Problems

Year. Month. Date. ()

Computing 3×3 determinants

1. a) $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix} = 1 \times \begin{vmatrix} 5 & 6 \\ 8 & 9 \end{vmatrix} - 2 \times \begin{vmatrix} 4 & 6 \\ 7 & 9 \end{vmatrix} + 3 \times \begin{vmatrix} 4 & 5 \\ 7 & 8 \end{vmatrix}$

$$= 1 \times (-3) + 2 \times (-6) + 3 \times (-3)$$

$$= -3 + 12 + 9 = 0$$

2. b) $\begin{vmatrix} 2 & 1 & -5 \\ 0 & 0 & 4 \\ 3 & 1 & 2 \end{vmatrix} = -4 \begin{vmatrix} 2 & 1 \\ 3 & 1 \end{vmatrix} = +4$

c) $\begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 6 & 0 \\ 1 & 0 & 2 & 0 \\ 1 & 5 & 1 & 2 \end{vmatrix} = 6 \cdot \begin{vmatrix} 1 & 2 & 4 \\ 1 & 0 & 0 \\ 1 & 5 & 2 \end{vmatrix} = 6 \cdot 1 \cdot (-16)$

$$= -96$$

Volumes and determinants

1. a) $\begin{vmatrix} 1 & 2 & 4 \\ 2 & 0 & 0 \\ 1 & 5 & 2 \end{vmatrix} = -2 \begin{vmatrix} 2 & 4 \\ 5 & 2 \end{vmatrix} = -2 \cdot (-4) = 8$

2. they are all in one plane.