19. For each matrix below, find the determinant of A.

(a) $A = \begin{bmatrix} 24 & -3 \\ 6 & 24 \end{bmatrix}$ $\det A = 24 \cdot 24 - (-3)6 = 576 + 18 = 594$

(b) $A = \begin{bmatrix} 10 & -1 & 7 & 5 \\ 24 & 20 & 6 & 12 \\ 30 & -9 & 51 & 15 \\ 4 & -9 & 15 & 2 \end{bmatrix}$ $\det A = 0$

$\vec{a}_1 = 2\vec{a}_4$

(c) $A = \begin{bmatrix} \frac{1}{2} & 1 & 3 \\ 10 & -1 & 5 \\ \frac{1}{3} & 0 & 0 \end{bmatrix}$ $\det A = \frac{1}{3}\begin{vmatrix} 1 & 3 \\ -1 & 5 \end{vmatrix} = \frac{1}{3}(5+3) = \frac{8}{3}$