Three-Point Form of an Equation of a Plane

An equation of the plane passing through the distinct points $(x_1, y_1, z_1), (x_2, y_2, z_2), (x_3, y_3, z_3)$, is:

$$det \begin{bmatrix} x & y & z & 1 \\ x_1 & y_1 & z_1 & 1 \\ x_2 & y_2 & z_2 & 1 \\ x_3 & y_3 & z_3 & 1 \end{bmatrix} = 0$$