1. Given the vertices of a quadrangle \(ABCD\), \(A = (1, 1), B = (4, 1), C = (3, -2)\) and \(D = (0, -2)\), determine whether they form a rectangle, a rhombus or a parallelogram.

2. Show that a triangle with vertices \((x_1, y_1), (x_2, y_2)\) and \((x_3, y_3)\) has area

\[
\frac{1}{2} |x_1y_2 + x_2y_3 + x_3y_1 - x_1y_3 - x_2y_1 - x_3y_2| = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}
\]

Hint: Name the vertices counterclockwise and draw the min-max box of the triangle. That is a rectangle whose sides are parallel to the axes and pass through the vertices.