Positive definite matrices

On page **72** of the course lecture notes**,** three equivalent conditions on a symmetric 2×2 matrix are stated**;** matrices with these property are said to be ***positive definite.*** A reference for the general result which contains the equivalence of these conditions as a special case of the **Principal Minors Theorem** on page **84** of the online document cited below**.** The proof of the theorem begins at the bottom of page **88** and concludes with the first paragraph on page **90.**

http://math.ucr.edu/~res/math132/linalgnotes.pdf

For a symmetric 2×2 matrix **A,** the condition in the cited theorem is that the upper left hand entry of **A** and the determinant of **A** should both be positive**;** this is actually a slightly weaker assumption than one of the conditions on page **72** of the notes for this course (in which the condition is that both the upper left and lower right entries should be positive**;** it turns out that if one of these two entries is positive and the determinant of **A** is positive**,** then the second entry is also positive)**.**