1. Prove that the altitudes are concurrent for a triangle with vertices at (0,0), (a,b), and (c,0). Does your proof work for any triangle? Explain.

2. Find an expression for the distance from a point (p,q) to the line $ax + by = c$. Explain your reasoning, and be sure to organize your solution so that a reader can see the major steps.

3. Using the picture below, prove that if two non-vertical lines are perpendicular, the product of their slopes is $-1$. You may assume that $x$ and $y$ are horizontal and vertical axes, respectively; that lines $j$ and $k$ are perpendicular and that $j$ has positive slope; that the segments of length $a$ and $c$ are vertical and collinear; and that the segment of length $b$ is horizontal.