Answer on Question #39484, Math, Geometry

Question.

If two non-parallel lines are perpendicular to two other straight lines, each to each. Show that the acute angle between first pair of line is equal to acute angle of second pair of line.

Solution.

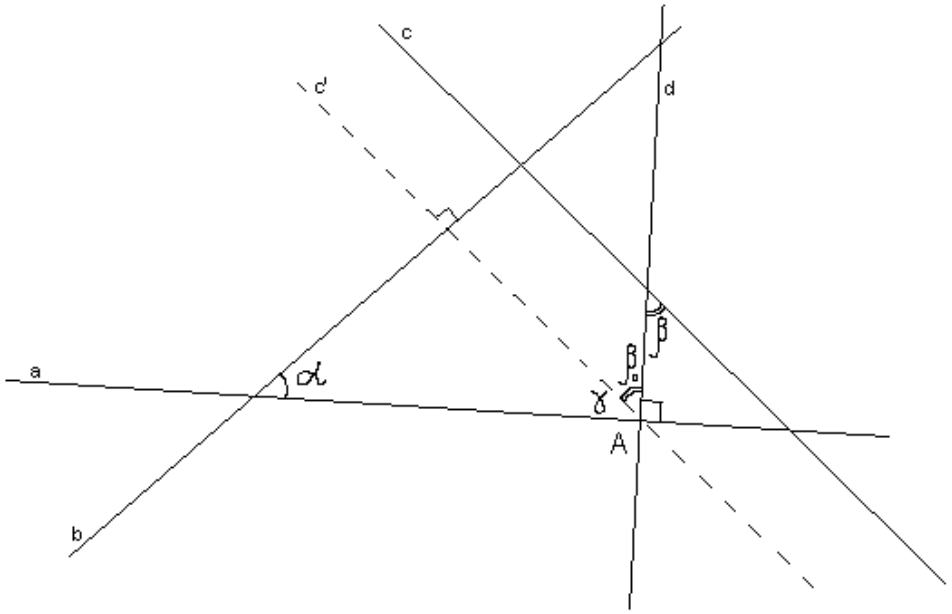

Fig. Illustration to the problem

We say that a pair of lines indicated a, b. The lines are perpendicular to them c, d.

1. Will move one of the parallel lines (c) so as to intersect the point (A) of intersection of a, d and call it $c^{/}$.
2. Then $\gamma=90^0-\alpha$ (due rectangular triangle composed of straight a, b, $c^{/}$), $\beta_0=90^0-\gamma$ (due to parallel lines a, d). Consequently, $\beta_0=\alpha$. On the other hand $\beta_0=\beta$, since c and $c^{/}$ parallel, and hence $\alpha=\beta$.

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