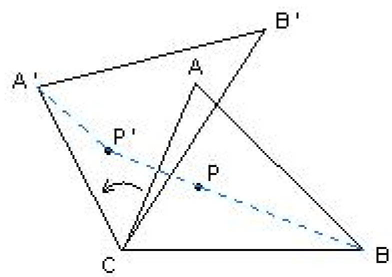
Problem) Consider an arbitrary triangle $\triangle ABC$. Where should a point P lie such that

$$|PA| + |PB| + |PC|$$

is minimized?

Solution 1) (Mathematical) Rotate the triangle $60°$ about point C.

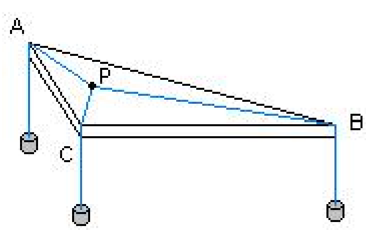


Note that

$$|PA| + |PB| + |PC| = |P'A'| + |PB| + |P'P|$$

which is minimized when A', P', P, B are collinear. It follows that P should lie where $\angle APB = \angle BPC = \angle CPA = 120°$.

Solution 2) (Physical) Consider a table with identical weights hanging as follows:



The system will be in equilibrium when the total potential energy is minimized. This occurs when the weights collectively hang as low as possible. Hence $|PA| + |PB| + |PC|$ will be minimized.

On the other hand, the system will be in equilibrium when the sum of the forces at P is zero. Hence $\angle APB = \angle BPC = \angle CPA = 120°$.