

Brief description of ideas for "TRIANGLES" task solving.

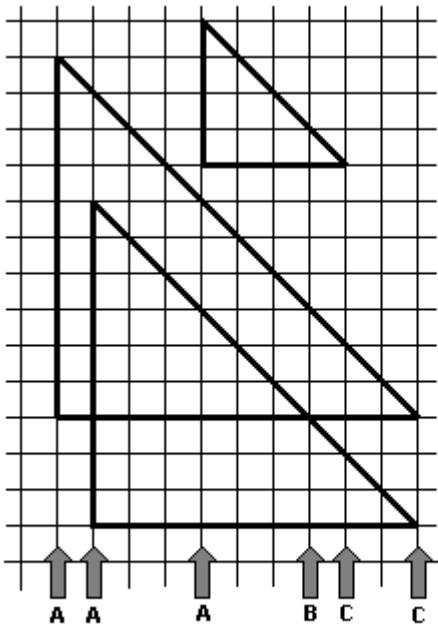


Fig. 1

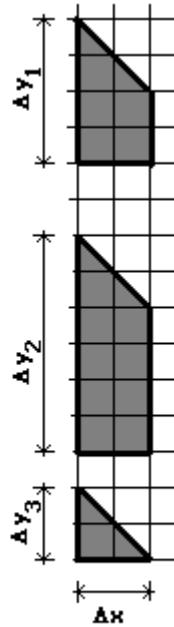


Fig. 2

We can use a plane sweep method sweeping from left to right. There are three kinds of event points for the algorithm (denoted in Figure 1 by gray arrows) :

- (A) beginning of new triangle (value x_i from description);
- (B) crossing point of one triangle horizontal edge with others hypotenuse;
- (C) rightmost vertex of some triangle (value x_{i+m_i} from task description).

If we look at these event points consecutively, we can calculate common area increasing, if we at each event point x_k know number n_k of actual line segments and sum of their lengths $s_k = \sum_i \Delta y_i$, where Δy_i is length of one segment. Example with three segments are shown in Figure 2.

Then increment for each gap between two neighbour event points ($\Delta x = x_{k+1} - x_k$) can be calculated as $s_k \Delta x - n_k \frac{(\Delta x)^2}{2}$. Performing sweeping from left to right and summing up these increments we finaly obtain total common area of all triangles.