Answer on Question #38881, Physics, Mechanics | Kinematics | Dynamics

A bee flies 504 m south, then 993 m south east; what is the resultant?

Solution.
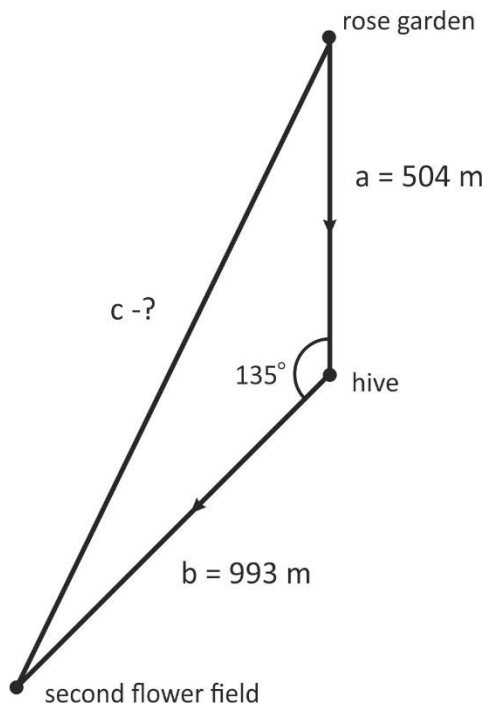We introduce the following notation.
a = 504 m (distance from a rose garden to the hive),
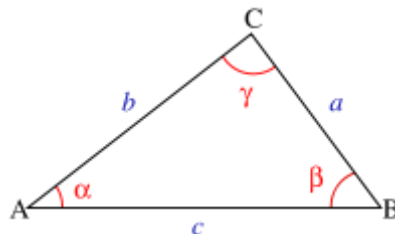b = 993 m (distance from a hive to the second flower field),
c - ? (distance from the first flower field to the second flower field),
γ = 135 ° (angle between the direction to the south and south-east direction).

I give the formula for the Law of Cosines and use it to find the missing side length of a triangle.

$$c^2 = a^2 + b^2 - 2ab \cos \gamma$$

$$c^2 = 504^2 + 993^2 - 2 \cdot 504 \cdot 993 \cdot \cos(135°)$$
$$\cos(135°) = -0.7071$$
$$c^2 = 1947832.5$$
$$c = \sqrt{1947832.5} = 1395.65 \approx 1396 \text{ m}.$$

Answer. 1396 m.