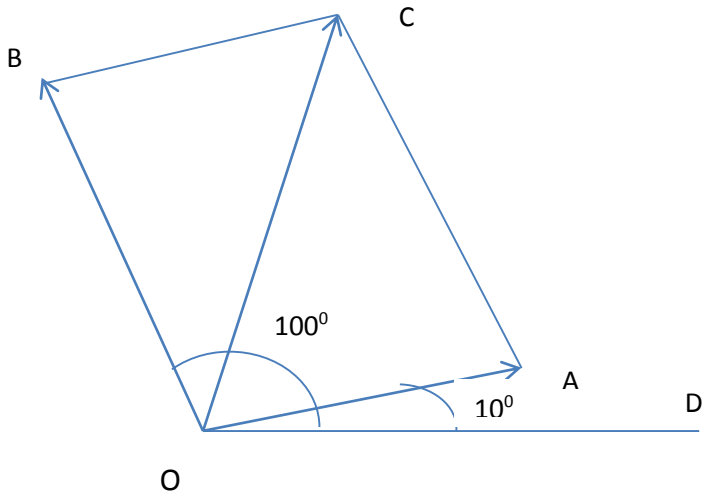
Answer on Question #42430 – Math - Analytic Geometry

Two forces with magnitudes of 25 and 30 pounds act on an object at angles of 10° and 100° respectively. Find the direction and magnitude of the resultant force. Round to two decimal places in all intermediate steps and in your final answer.

Help me please

Solution.



$$OA = 25, \quad OB = 30, \angle DOA = 10^0, \quad \angle DOB = 100^0,$$

$\angle BOA = \angle BCA = 100^0 - 10^0 = 90^0$, so $\angle OAC = \angle OBC = 90^0$.

Therefore $OC = \sqrt{OA^2 + AC^2} = \sqrt{OA^2 + OB^2} = \sqrt{25^2 + 30^2} = \sqrt{1525} \cong 39.05$

$$tan(\angle COA) = \frac{AC}{OA} = \frac{30}{25} = 1.2 \rightarrow \angle COA = arctan(1.2) = 50.19^0.$$

$\angle COD = \angle COA + \angle AOD = 50.19^0 + 10^0 = 60.19^0$.

Answer: magnitude of the resulting force equals 39.05 pounds,

direction of the resulting force equals 60.19^0.