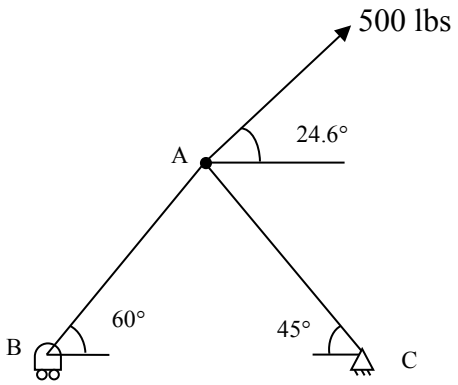
TOPIC

Engineering Mechanics (Statics and Dynamics) – Section VII – Question 7

QUESTION

For the 500 lb force, the components of the force in lbs along AC and AB respectively, most nearly are

(A) 300, 485
(B) 322, 227
(C) 229, 648
(D) 354, 469



HINT

This is a resolution problem along specific lines of action. To resolve, use the parallelogram of forces.

SOLUTION

This is a resolution problem along specific lines of action. To resolve, use the parallelogram as follows:

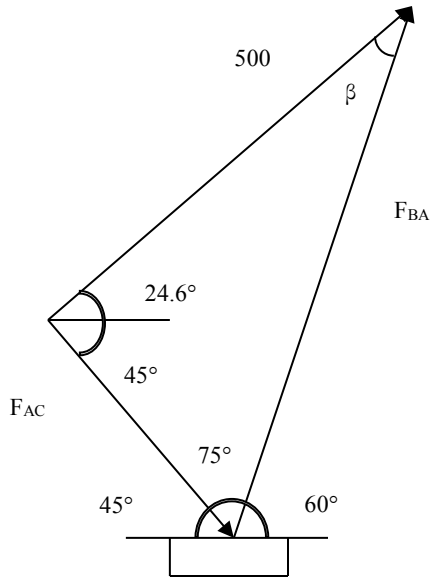
$$\beta = 180 - (69.6 + 75) = 35.4^o$$

By law of sines

$$\frac{sin(35.4)}{F_{AC}} = \frac{sin(75)}{500} = \frac{sin(69.6)}{F_{BA}}$$

Solving we get

$$F_{AC} = 300\text{lbs}$$
$$F_{BA} = 485\text{lbs}$$



Note: Most students will choose B by calculating.

$F_{AC} = 500\,cos(24.6)\,cos(45) = 322\text{lbs}$

$F_{BA} = 500\,cos(24.6)\,cos(60) = 227\text{lbs}$

which is not correct.

ANSWER

(A)

CONTRIBUTOR

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