Assignment 1 ICSE 2017

Gunjit Mittal (AI21BTECH11011)

Parameter	Symbol	Value
Height of tower	h	60m
Angle of dep. for ship A	θ_1	60°
Angle of dep. for ship B	θ_2	45°
Dist. of ship A from tower	x	?
Dist. of ship B from tower	y	?
Dist. of ship A from ship B	answer	?

1 QUESTION

The angles of depression of two ships A and B as observed from the top of a light house 60 m high are 60° and 45° respectively. If the two ships are on the opposite sides of the light house, find the distance between the two ships. Give your answer correct to the nearest whole number.
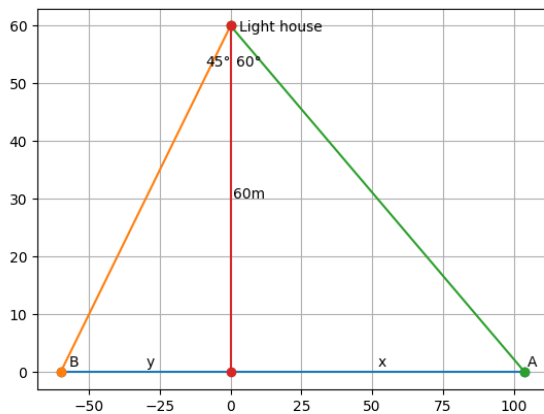
2 SOLUTION

Fig. 0. Diagram

The distance of ship A from light house (x) is given by

$$x = h \times \ \tan(\theta_1) \qquad (2.1)$$

The distance of ship B from light house (y) is given by

$$y = h \times \ \tan(\theta_2) \qquad (2.2)$$

Since the two ships are on opposite sides of the light house the distance between them can be obtained by adding their distances to the light house
$\therefore$ Distance between ships A and B (answer) =

$$
\begin{aligned}
answer &= x + y \\
&= h \times \theta_1 + h \times \theta_2 (from\ (2.1) and\ (2.2)) \\
&= 60 \times \sqrt{3} + 60 \times 1 \\
&= 103.92 + 60 = 163.92 \quad (2.3)
\end{aligned}
$$

$$\implies \ answer = 164$$