Assignment 1 ICSE 2017

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Q11 (a)

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.
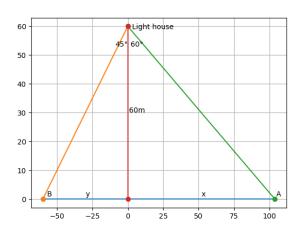
Solution

$\therefore$ Distance between ships A and B (answer) $=$

$$x + y = h \times \theta_1 + h \times \theta_2$$
$$= 60 \times \sqrt{3} + 60 \times 1$$
$$= 103.92 + 60 = 163.92$$

$\implies$ answer $= 164$

Fig. 0. Diagram

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	?

The distance of ship A from light house (x) is given by $h \times \tan(\theta_1)$
The distance of ship B from light house (y) is given by $h \times \tan(\theta_2)$
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