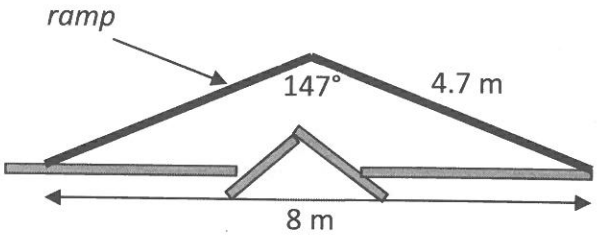
Example 8

You are in charge of designing a wooden ramp to go over a section of heaved concrete on a sidewalk in the city. The design is shown below. Powered wheelchairs can traverse the ramp only if the angle that the ramp makes with the sidewalk is less than 15°. Will your design be able to accommodate people in powered wheelchairs? Justify your answer.



This is a sine law problem, as we are given partners (the 8 m and the 147°). Set it up to find the angle at the BOTTOM LEFT of the diagram (opposite the 4.7 m).

$$\frac{8}{\sin 147°} = \frac{4.7}{\sin \theta}$$

$$\sin \theta = 4.7 \times \sin 147° \div 8$$
$$\sin \theta = 0.3199754331 \ldots$$

$$\theta = \mathbf{18.66°}$$