Maths in Sports

Question problem

The playing court of a roller skating hockey field has a rectangular shape and with proportional dimensions, always respecting the ratio two to one between, respectively, the length and its width. Admit that Figure 1 illustrates the skating field of the União Desportiva Oliveirense (UDO), whose width is $20\ m$.

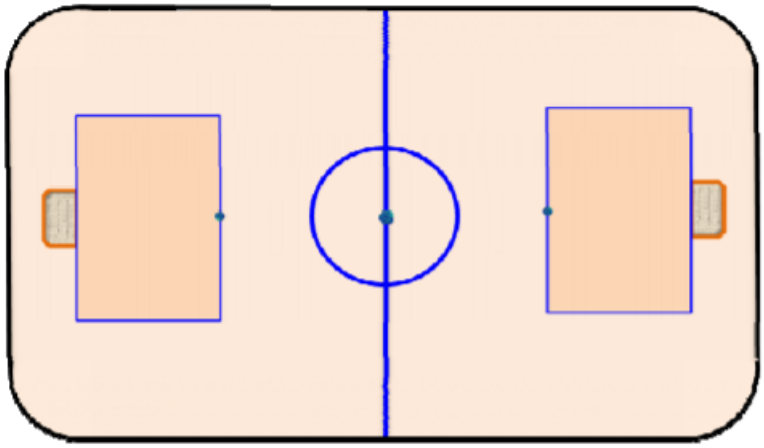

Figure 1- Roller skating hockey field

In the last class of the subject of Physical Education the teacher of the classes of Eduarda, Marília and Diogo proposed to his students the following situation:

Imagine that Eduarda places herself at point E at 10 m from the [AD] side and at 4 m from the [CD] side, Eduarda's teammate Marília stands at the midpoint on the [AB], M, and Diogo of the opposing team occupies a position, $\overline{DQ}$, between the positions occupied by the opposing colleagues so as not to allow the direct pass between them.

Assuming that the angle of incidence of the ball when it hits the lateral fencel is equal to the angle of reflection, determine to what distance d of the corner D the ball should hit the lateral fence, so that Marília receives the ball, according to Figure 2. Present the result with one decimal place.

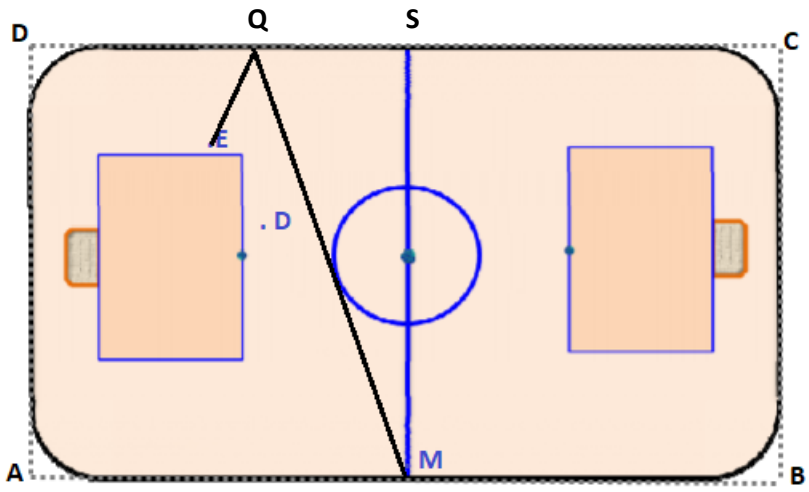

Figure 2