1. Dragon (5 points) — *Aigar Vaigu.* Here is a photo of a dragon under water (there is a larger photo on a separate sheet). The length of the dragon is $l = 8\,\text{cm}$ and its height is $h = 3\,\text{cm}$. The diameter of the bottom of the bowl is $d = 10\,\text{cm}$ and the angle between the table and the side of the bowl is $\alpha = 60°$. The refractive index of water is $n = 1.33$. The photo has been taken so that the camera was pointing directly along the water surface. In the following questions the angle between the horizon when looking at some point on the image of the dragon is defined as the angle between the horizontal water surface (or any other horizontal surface) and the straight line from the eye to that point on the image.



i) *(2 points)* What is the largest angle below the horizon from which the reflection of the dragon from the water surface can be seen?

ii) *(3 points)* What is the highest angle above the horizon from which this reflection can be seen?