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- 1 A wine glass with a cross section as shown has the property of an orange in shape as a sphere with a radius of 3 cm just can be placed in the glass without protruding above glass. Determine the height h of the glass.
https://1.bp.blogspot.com/-IuLm_IPTvTs/XzcH4FAjq5I/AAAAAAAAAMYy/qMi4ng91us8XsFUtnwS-hb6PqjwCLcBGAsYHQ/s0/1994%2BMohr%2Bp1.png

- 2 A train travels a certain distance at a constant speed. Whose speed is increased by 10 kilometers per hour, the trip can be made 40 minutes faster. If, on the other hand, the speed is reduced by 10 kilometers per hour, the trip takes 1 hour further. How long is the distance traveled?

- 3 The third-degree polynomial $P(x) = x^3 + 2x^2 - 3x - 5$ has the three roots a, b and c . State a third degree polynomial with roots $\frac{1}{a}, \frac{1}{b}$ and $\frac{1}{c}$.

- 4 In a right-angled triangle in which all side lengths are integers, one has a cathetus length 1994. Determine the length of the hypotenuse.

- 5 In a right-angled and isosceles triangle, the two catheti are both length 1. Find the length of the shortest line segment dividing the triangle into two figures with the same area, and specify the location of this line segment