Frosty the snowman is made from two uniform spherical snowballs, of initial radii 2*R* and 3*R*. The smaller (which is his head) stands on top of the larger.

As each snowball melts, its volume decreases at a rate which is directly proportional to its surface area, the constant of proportionality being the same for both snowballs. During melting each snowball remains spherical and uniform.

* When Frosty is half his initial height, show that the ratio of his volume to his initial volume is
37 : 224 .
* What is this ratio when Frosty is one-tenth of his initial height?



*Frosty the snowman returns in the problem*

*“A Frosty Puddle”*

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