

5. (15 points) Suppose that you are brewing coffee and that hot water is passing through a special, cone-shaped filter (see below). Assume that the height of the conic filter is 3 in. and that the radius of the base of the cone is 2 in. If the water is flowing out of the bottom of the filter at a rate of $1.5 \text{ in}^3/\text{min}$ when the remaining water in the filter is 2 in. deep, how fast is the depth of the water changing at that instant?

[Note: if d is depth of the water in the cone and the radius is r , the volume is given by $V = \frac{1}{3}\pi r^2 d$.]

