Water from a conical filter drips into a cup that is in the shape of a right circular cylinder. The dimensions of the cone and cup are given in the picture below. Let x represent the depth of the water in the filter and y the depth of the water in the cup. If 30π in³ of water is poured into the filter and drips out of the filter at a rate of 3 in³ /min., then how fast is the water level in the cone changing when x = 1 in.? How fast is the water level in the cup changing when x = 1 in.? What is the depth of the water in the cup when x = 1 in.? Give exact values first, then approximate to the nearest 0.01.

