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 in^3 of water is poured into the filter and drips out of the filter at a rate of 3 in^3/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.

5"

6"

x

8"

y

10"