Math 30 ***Quiz*** ***September 28, 2017***

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.