1. A bathtub is 152 cm long, 78 cm wide, and 46 cm high.
   a) If the bathtub takes 40 s to drain when it is $\frac{3}{4}$ full, what is the rate at which water can be drained from the bathtub? (Assume that water drains from the bathtub at a constant rate.)
   b) At what rate is the depth of the water in the bathtub changing while the bathtub is draining?
   c) The bathtub is replaced by a water storage tank in the shape of an inverted cone, with a height of 90 cm and a diameter of 140 cm. Assuming the rate at which water can be drained remains the same, what is the rate of change of the depth of water when the water is
      i) 50 cm deep?
      ii) 10 cm deep?