1. Differentiate
$$(\tan x)^{1/x}$$

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2. A ball is thrown up. At time t it is at height $5t - 10t^2$. When is it at rest?

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3. A freshley brewed cup of coffee has temperature 95°C is a20°C room. After 30 minutes its temperature is 70°C. When it is cooling at the rate of 1°C/min?