Linearity assignment

1. Prove that $f(x) = \beta x$ is linear

$f'(x) = \beta$

$f''(x) = 0$

2. Prove that $f(x) = \beta_0 + \beta_1 x + \beta_2 x^2$ is not linear.

$f'(x) = \beta_1 + 2\beta_2 x$ (not constant)

$f''(x) = 2\beta_2$ (not equal to 0)