2. [12 points] Let $f(x)$ be a positive, continuous and differentiable, non-constant function. Let $F(x)$ be an antiderivative of f that passes through the origin. For each of the following, find all values of the constant a for which the statement is true. Include your work and/or a short explanation so that it is clear how you obtain your answers.

    a. [4 points] $F(x) = \int_a^x f(t)\,dt$

    b. [4 points] $\int_0^a x\,f'(x)\,dx = f(a) - F(a)$.

    c. [4 points] $\int 5 f(\frac{x}{a})\,dx = F(\frac{x}{a}) + C$