1. True. The Taylor series of any polynomial at any point is the polynomial.

2. False. Newton's method only outputs approximations of the roots.

   (a) The Taylor series for $g(x) = e^x$ at $x = 0$ is $T_g(x) = 1 + x + \frac{x^2}{2} + \cdots + \frac{x^i}{i!} + \cdots$ so to find the Taylor series for $f(x) = g(x^2)$, plug x^2 in for x in $T_g(x)$.
   Thus, the Taylor series for $f(x) = e^{x^2}$ is $T_f(x) = 1 + x^2 + \frac{x^4}{2} + \cdots + \frac{x^{2i}}{i!} + \cdots$.
   In sum notation, this is $T_f(x) = \sum_{i=0}^{\infty} \frac{x^{2i}}{i!}$.

   (b) We want to find $\sqrt{99}$, so we want to find the positive root of $f(x) = x^2 - 99$.
   The formula for one iteration of Newton's method is $x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$.
   Thus, $x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 10 - \frac{1}{2*10} = 10 - \frac{1}{20} = \frac{199}{20}$.