6. (15 points) For each of the following statements, circle T if the statement is always true, and otherwise circle F. You need not explain your answer.

(a) The formula \(1 + x + x^2 + \cdots + x^n = \frac{1 - x^{n+1}}{1 - x}\) holds for all real numbers \(x \neq 1\) and all positive integers \(n = 1, 2, 3, \ldots\).

(b) If \(g(x)\) is a periodic function, then every solution \(y = f(x)\) of the differential equation \(\frac{dy}{dx} = g(x)\) is also a periodic function.

(c) If \(y = f(t)\) is a solution of the differential equation \(\frac{dy}{dt} = y^2 - t\), then for every constant \(C\), \(f(t) + C\) is also a solution of the differential equation.

(d) The function \(y(t) = 0\) is a solution of the initial value problem

\[
\frac{dy}{dt} = 3t - y^3, \quad y(0) = 0.
\]

(e) There is a solution of the logistic differential equation \(\frac{dP}{dt} = 0.03P \left(1 - \frac{P}{3}\right)\) that satisfies \(P(1) = 1\) and \(P(20) = 5\).