Is is Linear?

Quiz: Is it Linear?
We will develop a theory of linear equations, complete with an algorithm for solving them. It’s important to recognize them when you see them.

Which of the following are linear ODE’s?
1. \( \dot{x} + x^2 = t \)
2. \( \dot{x} = (t^2 + 1)(x - 1) \)
3. \( \dot{x} + x = t^2 \)

Choices:
a) None  
b) (1) only  
c) (2) only  
d) (3) only  
e) All  
f) All but (1)  
g) All but (2)  
h) All but (3)

Answer:
Equations (2) and (3) are linear; (1) is not: the correct answer is (f).