Quiz 4

Name: _____

Do not solve any of these equations!

1. For these differential equations, (i) identify the order of the eqation, and (ii) decide whether the equation is linear or non-linear.

   (a) $y''' + y' + y = 0$

   (b) $\dfrac{dy}{dx} = y^2$

   (a) is a third-order (order is 3) *linear* DE. (b) is a non-linear first-order (order is 1) DE. This is non-linear because of the appearance of y^2.

2. For these differential equations, identify whether they are pure-time, autonomous, or neither.

   (a) $\dfrac{dy}{dt} = 10t^4 + e^t$

   (b) $y' = ty$

   (c) $y' = \sin(y)$

   (a) is pure-time. (b) is neither. (c) is autonomous.