

Math 366, Spring 2016, Quizz 1

NAME:

1. For each of these differential equations, tell whether it is separable, homogeneous, linear, exact or none of the above. Do not solve the equation.

a) $e^y \frac{dy}{dx} = x + x^3$,
Separable.

b) $3y + e^x + (3x + \cos y) \frac{dy}{dx} = 0$,
Exact.

c) $xdy + (y + y^2 \log x)dx = 0$,
None.

d) $(x^2 + y^2)dy + x(x + y)dx = 0$,
Homogeneous.

e) $(x^2 + 1) \frac{dy}{dx} + 3xy = 6e^x$.
Linear.

2. Solve $y' = e^{x-y}x$.

$$e^y dy = e^x x dx, \quad e^y = xe^x - e^x + C, \quad y = \log(xe^x - e^x + C).$$