

Math 3331 ODEs 1st Order Review

1. Identify the type of first order ODE: Separable, linear, Bernoulli, Ricatti, homogeneous or exact.

$$(1) \quad \frac{dy}{dx} = \frac{x-y}{x}$$

$$(2) \quad (x+1)\frac{dy}{dx} = 10-y$$

$$(3) \quad \frac{dy}{dx} = \frac{x}{y} + \frac{y}{x} + 1$$

$$(4) \quad 2xy\frac{dy}{dx} + y^2 = x^2$$

$$(5) \quad \frac{dy}{dx} = -\frac{3y^2 + 2x}{6xy + 4y^2}$$

$$(6) \quad \frac{dy}{dx} = y - xy^2$$

$$(7) \quad \frac{dy}{dx} = \frac{2x}{y} + \frac{1}{y} + 2x + 1$$

$$(8) \quad x\frac{dy}{dx} + 2y = x \sin x$$

$$(9) \quad \frac{dy}{dx} = -\frac{x^2 + y}{x + y^2}$$

$$(10) \quad \frac{dy}{dx} = \frac{x^2 + y^2}{x^2 + xy}$$

$$(11) \quad \frac{dy}{dx} = x^2 + y$$

$$(12) \quad \frac{dy}{dx} = \frac{1 - y \cos x}{2y + \sin x}$$

$$(13) \quad \frac{dy}{dx} + \frac{y}{2x} = \frac{x}{y^3}$$

$$(14) \quad \frac{dy}{dx} = \frac{y(x-y)}{x(x+y)}$$

$$(15) \quad \frac{dy}{dx} = x^2y^2 + x^2$$