Form	Class	Remarks
$\frac{dy}{dx} = f(y).$	Autonomous	See critical points
$\frac{dy}{dx} = g(x)h(y)$	Separable	Isolation. Careful about losing singular solutions
$\frac{dy}{dx} + P(x)y = f(x).$	Linear	Multiply integrating factor $\mu(x) = e^{\int P(x)dx}$ Then use exact differential
$M(x, y)\,dx + N(x, y)\,dy = 0$	Exact	Verify exactness: $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}.$
$M(x, y)\,dx + N(x, y)\,dy = 0$	Non-exact but can be made Exact	Integrating factor. Try: $\mu(x) = e^{\int \frac{M_y - N_x}{N} dx}.$ If $(M_y - N_x)/N$ is a function of x alone, __________ Try: $\mu(y) = e^{\int \frac{N_x - M_y}{M} dy}.$ If $(N_x - M_y)/M$ is a function of y alone,
$M(x, y)\,dx + N(x, y)\,dy = 0$ (where M and N are hom. func)	Homogeneous (Eq. with homogeneous functions)	Substitute $y = ux$ or $x = vy,$ Reduces to separable
$\frac{dy}{dx} + P(x)y = f(x)y^n,$	Bernoulli	Substitute $u = y^{1-n}$ Becomes linear

$\frac{dy}{dx} = f(Ax + By + C)$	Reduction to separation of variables	Substitute $u = Ax + By + C, B \neq 0.$ Becomes separable