

If the right-hand side of the equation

$$\frac{dy}{dx} = f(x, y)$$

can be expressed as a function of the ratio y/x alone, then we say the equation is *homogeneous*.

In this context, homogeneous means that the x and y variables have a balanced presence.

In a homogeneous equation, the substitution

$$u = \frac{y}{x}, \quad \frac{dy}{dx} = u + x \frac{du}{dx}$$

will reduce it to a separable equation.