

# integral factor

جدول فاکتور های انتگرال برای معادلات دیفرانسیل



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Group of terms	Integrating factor $I(x, y)$	Exact differential $dg(x, y)$
$y dx - x dy$	$-\frac{1}{x^2}$	$\frac{x dy - y dx}{x^2} = d\left(\frac{y}{x}\right)$
$y dx - x dy$	$\frac{1}{y^2}$	$\frac{y dx - x dy}{y^2} = d\left(\frac{x}{y}\right)$
$y dx - x dy$	$-\frac{1}{xy}$	$\frac{x dy - y dx}{xy} = d\left(\ln\frac{y}{x}\right)$
$y dx - x dy$	$-\frac{1}{x^2 + y^2}$	$\frac{x dy - y dx}{x^2 + y^2} = d\left(\arctan\frac{y}{x}\right)$
$y dx + x dy$	$\frac{1}{xy}$	$\frac{y dx + x dy}{xy} = d(\ln xy)$
$y dx + x dy$	$\frac{1}{(xy)^n}, n > 1$	$\frac{y dx + x dy}{(xy)^n} = d\left[\frac{-1}{(n-1)(xy)^{n-1}}\right]$
$y dy + x dx$	$\frac{1}{x^2 + y^2}$	$\frac{y dy + x dx}{x^2 + y^2} = d\left[\frac{1}{2}\ln(x^2 + y^2)\right]$
$y dy + x dx$	$\frac{1}{(x^2 + y^2)^n}, n > 1$	$\frac{y dy + x dx}{(x^2 + y^2)^n} = d\left[\frac{-1}{2(n-1)(x^2 + y^2)^{n-1}}\right]$
$ay dx + bx dy$ ( $a, b$ constants)	$x^{a-1} y^{b-1}$	$x^{a-1} y^{b-1}(ay dx + bx dy) = d(x^a y^b)$