Fourth-order Runge-Kutta Method:

$\dfrac{dy'}{dx} = f\left(x,\,y,\,y'\right)$	$\dfrac{dy}{dx} = y'$
$y'_{i+1} = y_i + \frac{1}{6}\left(f_1 + 2f_2 + 2f_3 + f_4\right)h$	$y_{i+1} = y_1 + \frac{1}{6}\left(F_1 + 2F_2 + 2F_3 + F_4\right)h$
$f_1 = f\left(x_i,\,y_i,\,y'_i\right)$	$F_1 = y'_i$
$f_2 = f\left(x_i + \frac{1}{2}h,\,y_i + F_1\frac{1}{2}h,\,y'_i + f_1\frac{1}{2}h\right)$	$F_2 = y'_i + f_1\frac{1}{2}h$
$f_3 = f\left(x_i + \frac{1}{2}h,\,y_i + F_2\frac{1}{2}h,\,y'_i + f_2\frac{1}{2}h\right)$	$F_3 = y'_i + f_2\frac{1}{2}h$
$f_4 = f\left(x_i + h,\,y_i + F_3h,\,y'_i + f_3h\right)$	$F_4 = y'_i + f_3h$
$y'_{i+1} = y_i + \frac{1}{6}\left(f_1 + 2f_2 + 2f_3 + f_4\right)h$	$y_{i+1} = y_i + y'_i h + \frac{1}{6}\left\{f_1 + f_2 + f_3\right\}h^2$
$f_1 = f\left(x_i,\,y_i,\,y'_i\right)$	
$f_2 = f\left(x_i + \frac{1}{2}h,\,y_i + y'_i\frac{1}{2}h,\,y'_i + f_1\frac{1}{2}h\right)$	
$f_3 = f\left(x_i + \frac{1}{2}h,\,y_i + y'_i\frac{1}{2}h + f_1\frac{1}{4}h^2,\,y'_i + f_2\frac{1}{2}h\right)$	
$f_4 = f\left(x_i + h,\,y_i + y'_i h + f_2\frac{1}{2}h,\,y'_i + f_3h\right)$	