$$\begin{cases} y' = \frac{x^2+2y}{x} \\ y(1) = 2 \end{cases}$$

$x_0 = 1$

$y_0 - 2$

1 4^a Ordem

$$y_{n+1} = y_n + \frac{1}{6}(k_1 + 2k_2 + 2k_3 + k_4)$$

$$k_1 = hf(x_n, y_n)$$

$$k_2 = hf\left(x_n + \frac{h}{2}, y_n + \frac{k_1}{2}\right)$$

$$k_3 = hf\left(x_n + \frac{h}{2}, y_n + \frac{k_2}{2}\right)$$

$$k_4 = hf(x_n + h, y_n + k_3)$$

$y(1.3)$

$h = 0.3$

$$\left|\begin{array}{c|c} \text{x} & 1 \\ \text{y} & 2 \\ \text{k}_1 & 0.3\left(\frac{1^2+2\cdot 2}{1}\right) = 1.5 \\ \text{k}_2 & 0.3\left(\frac{1.15^2-2\cdot 2.75}{1.15}\right) = 1.77978 \\ \text{k}_3 & 1.85276 \\ \text{k}_4 & 2.16820 \end{array}\right|$$

$$y_1 = y_0 + \frac{1}{6}[1.5 + 2(1.77978) + 2(1.85276) + 2.16820]$$

$y_1 = y(1.3) = 3.82222$

2 1^a ordem

$$y_{n+1} = y_n + hy'$$

$$y_{n+1} = y_n + hf(x_n, y_n)$$

3 2^a ordem

$$y_{n+1} = y_n + \frac{h}{2}(k_1 + k_2)$$
$$k_1 = f(x_n, y_n)$$
$$k_2 = f(x_{n+1}, y_n + hf(x_n, y_n))$$