NMA – homework from week **10**

Consider mixed problem for the heat equation

$$\frac{\partial u}{\partial t} = \frac{1}{2}\frac{\partial^2 u}{\partial x^2} + x + 2t \quad \text{on } \Omega = (0,5) \times (0,10)$$
$$u(0,t) = 3t\,, \quad u(5,t) = 2t + 20 \quad \text{for } t \in <0,10>$$
$$u(x,0) = 4x \qquad\qquad\qquad\qquad \text{for } x \in <0,5>$$

a) Check that for the choice of step $h = 1$ in the x-direction and time-step $\tau = 0.5$, the explicit scheme is stable.

b) Compute approximate value of $u(4,1)$ using the explicit scheme with $h = 1$, $\tau = 0.5$.