1 Gaussian Pulses

$$
\begin{cases}
u_{tt} = u_{xx}, & 0 < x < 10,\ t \geq 0 \\
u(x,0) = \exp[-(x-5)^2]/\sqrt{2\pi}, & 0 < x < 10 \\
u_t(x,0) = 0, & 0 < x < 10 \\
u(0,t) = u(10,t) = 0, & t \geq 0.
\end{cases} \tag{1}
$$

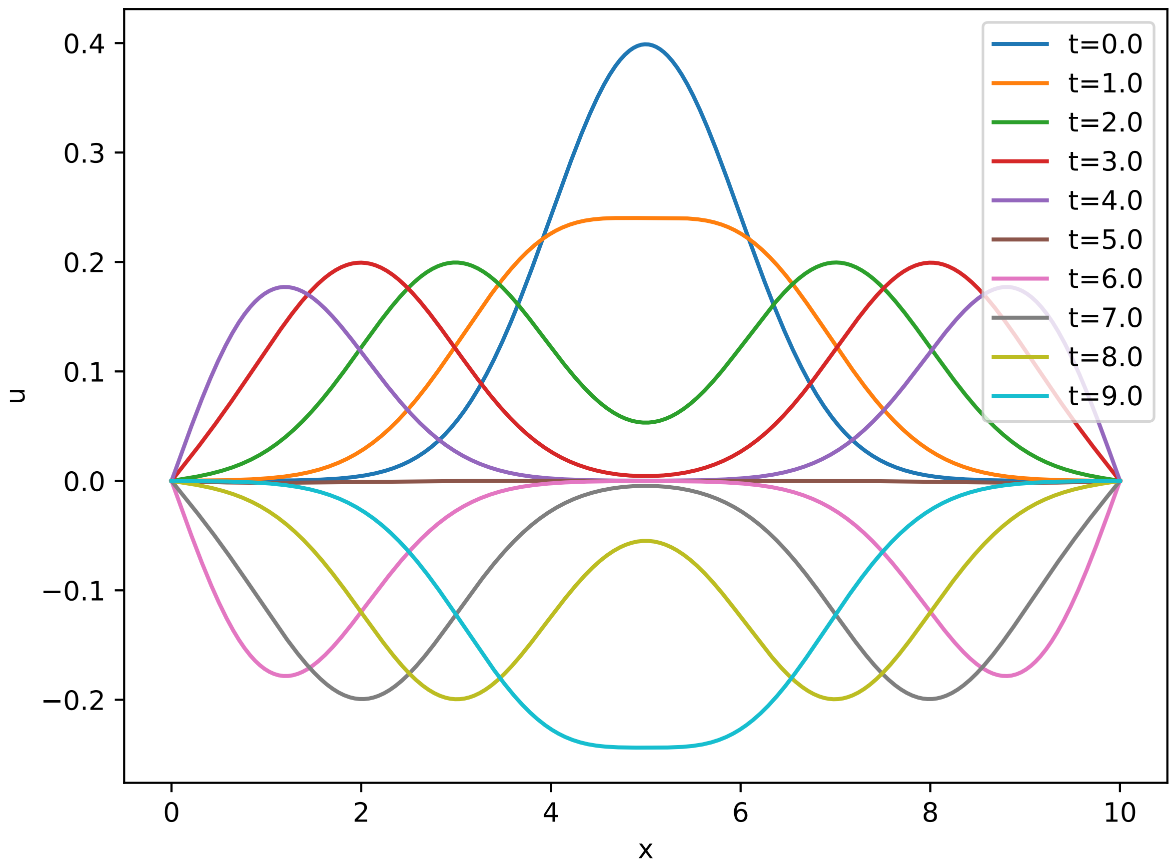

Figure 1: IBVP (1) for $t = 0, 1, 2, ..., 9$.

$$
\begin{cases}
u_{tt} = u_{xx}, & 0 < x < 10,\ t \geq 0 \\
u(x,0) = \exp[-(x-5)^2]/\sqrt{2\pi}, & 0 < x < 10 \\
u_t(x,0) = 0, & 0 < x < 10 \\
u(0,t) = 0, & t \geq 0 \\
u_x(10,t) = 0, & t \geq 0.
\end{cases} \tag{2}
$$

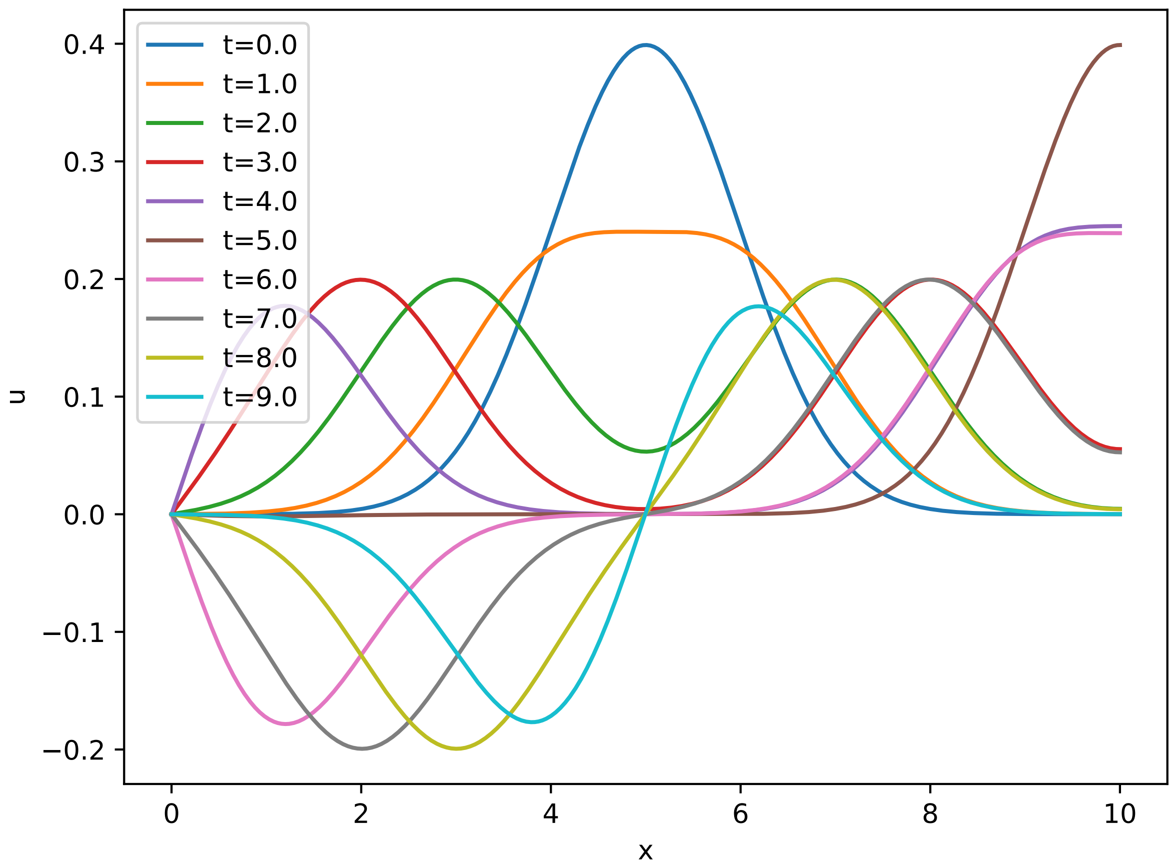

Figure 2: IBVP (2) for $t = 0, 1, 2, ..., 9$.

1.1 $c_1 < c_2$

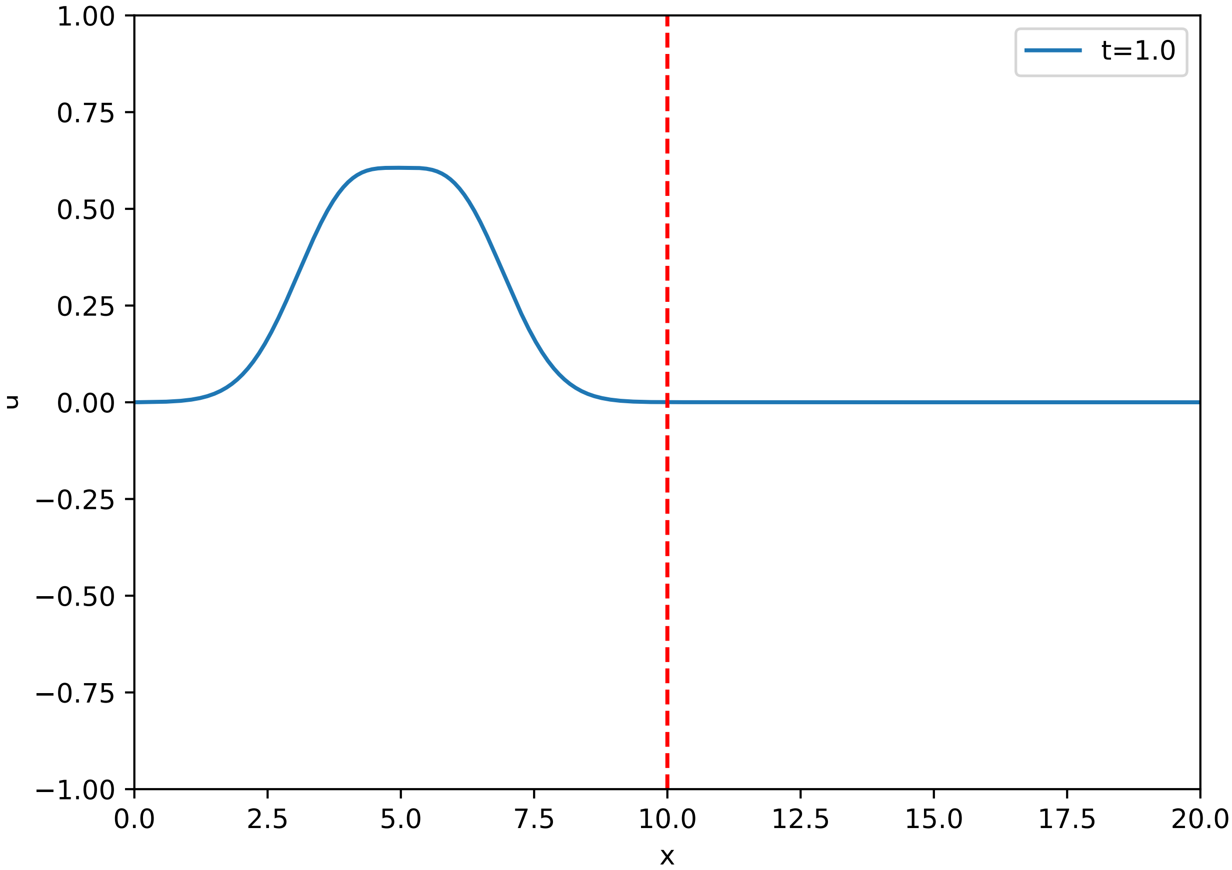

Figure 3: $c_1 = 1, c_2 = 4$

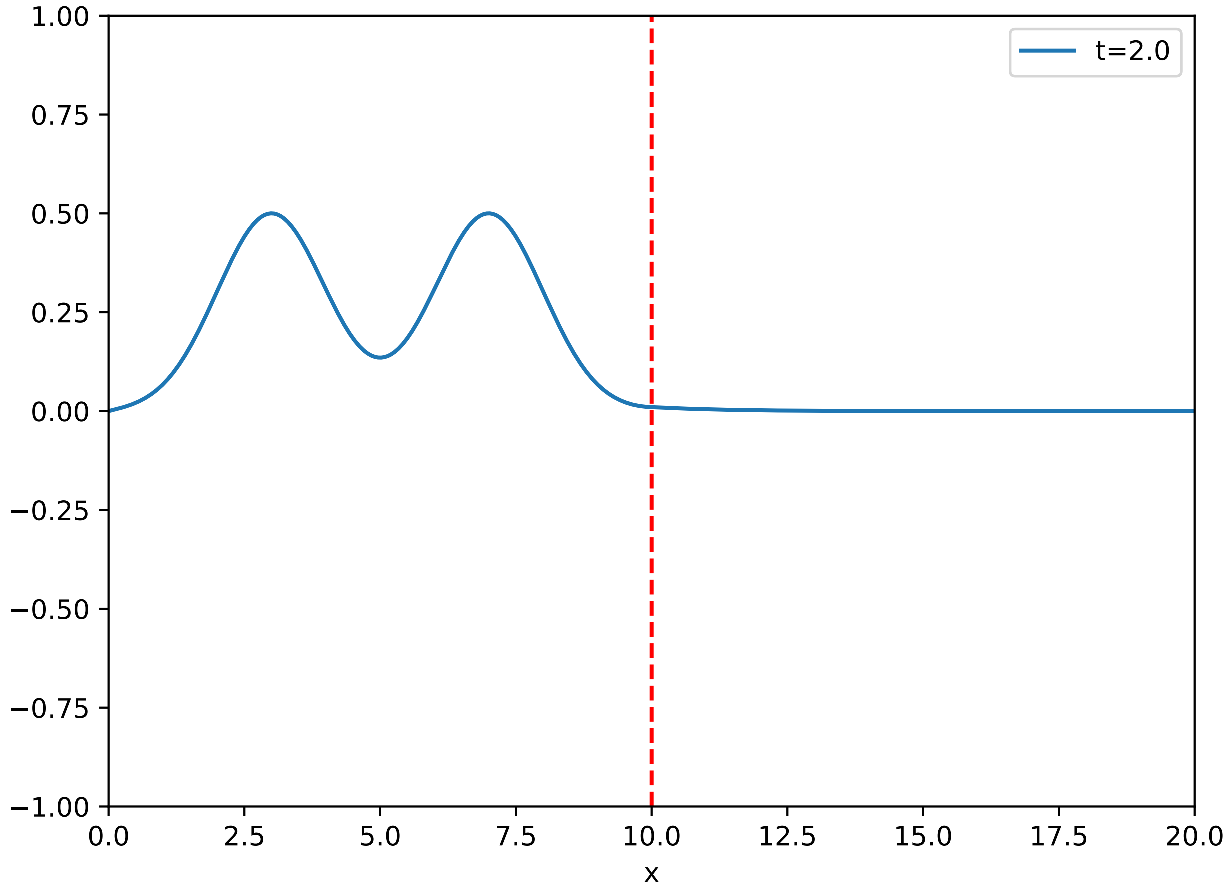

Figure 4: Caption

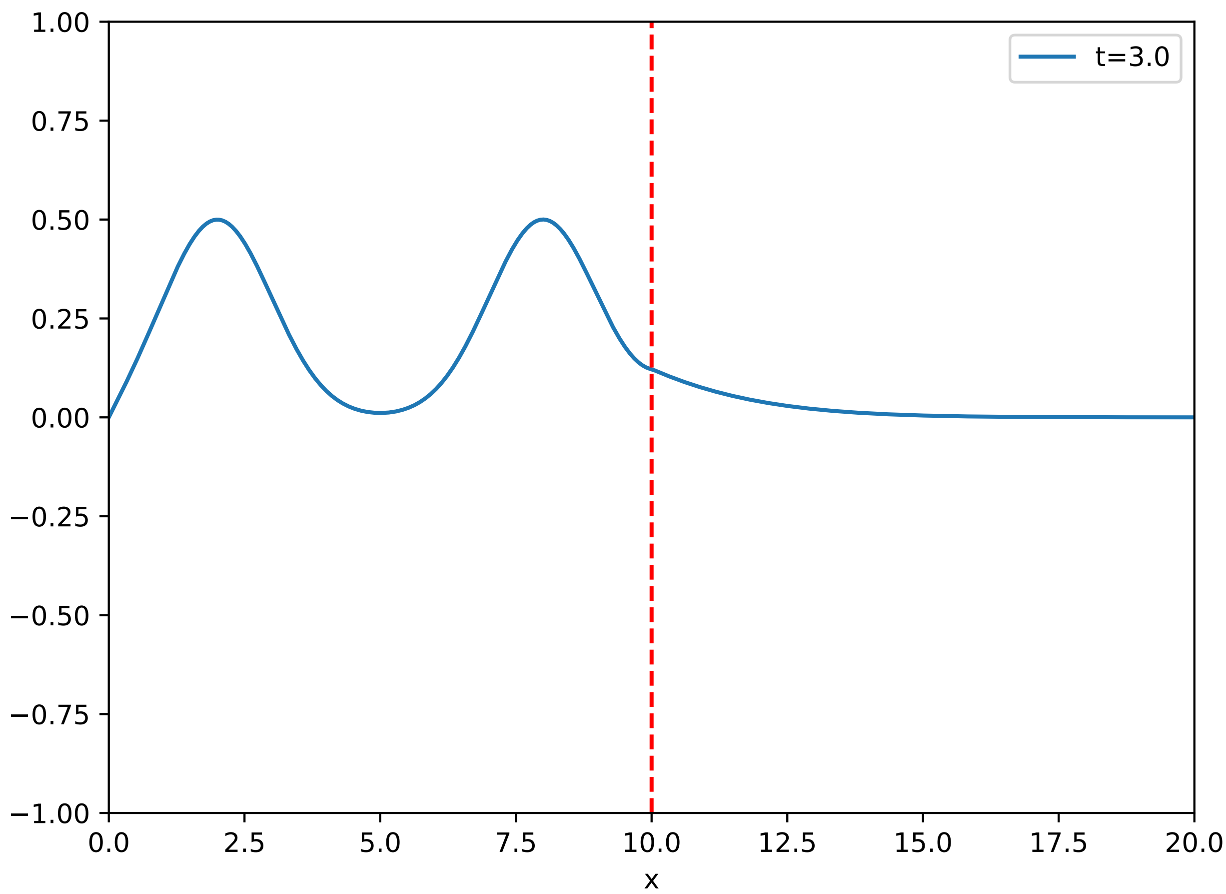

Figure 5: Caption

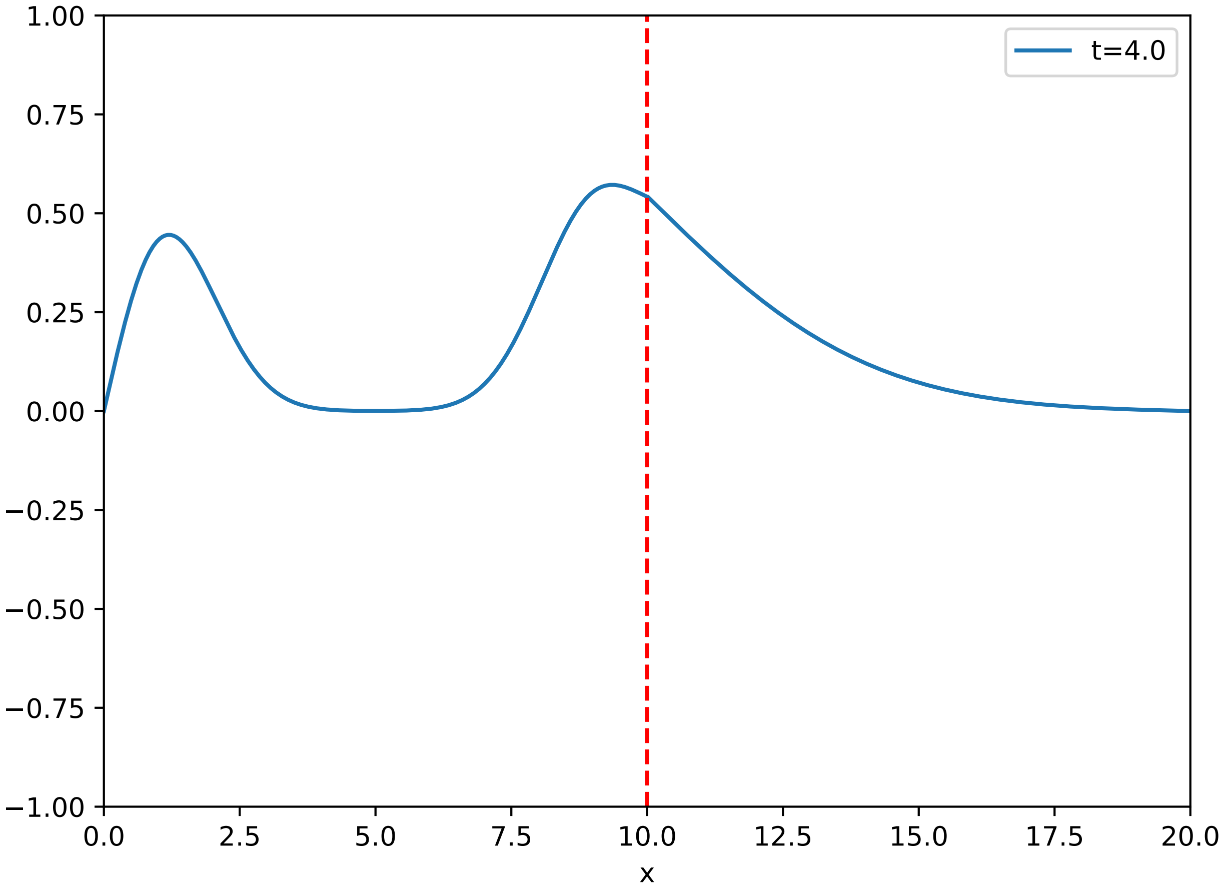

Figure 6: Caption

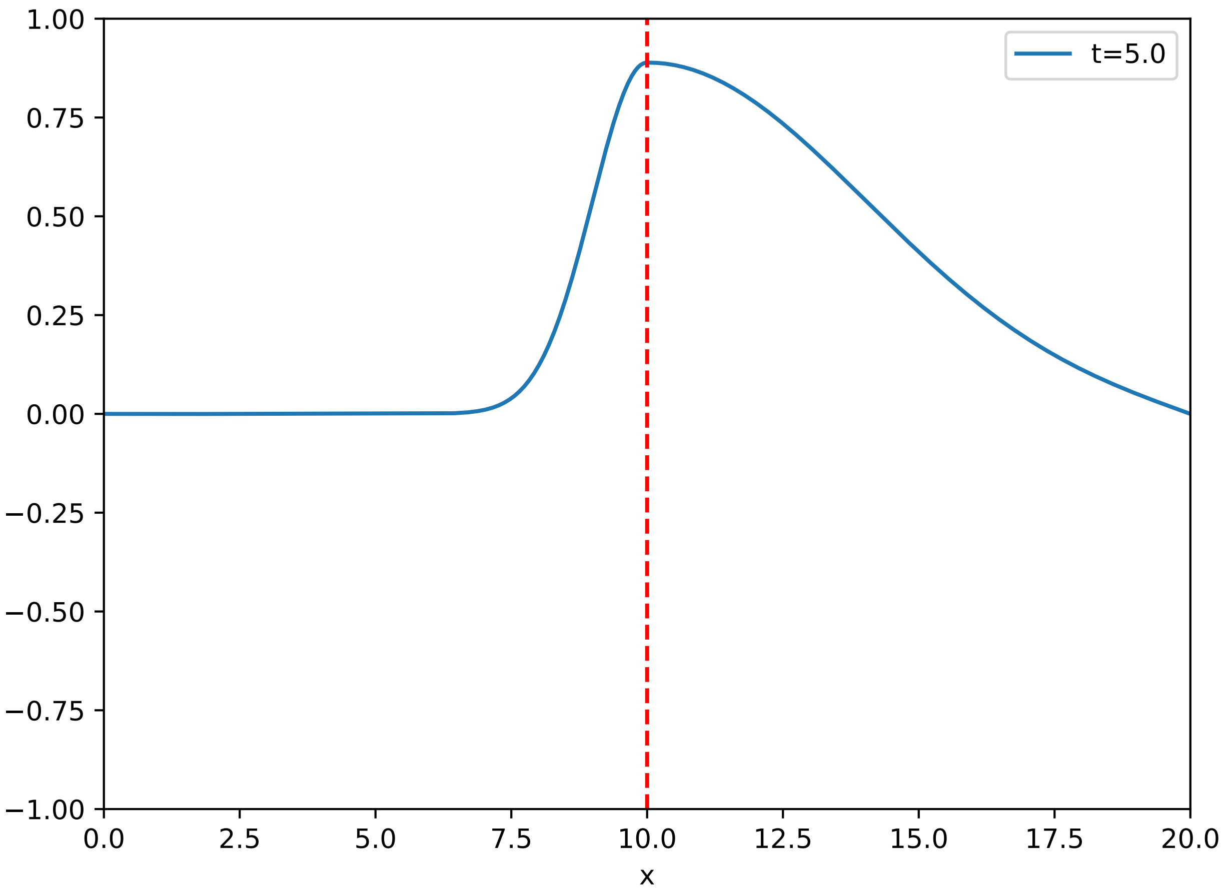

Figure 7: Caption

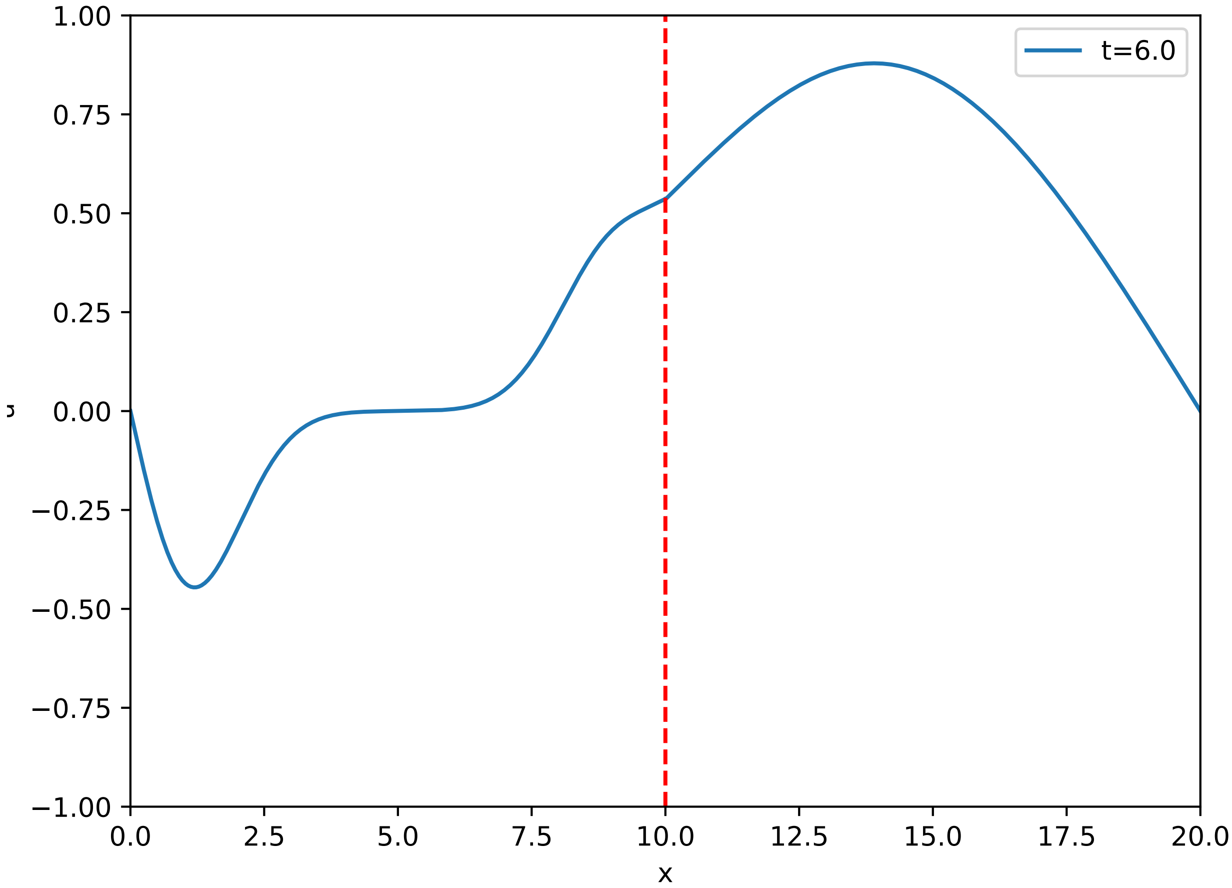

Figure 8: Caption

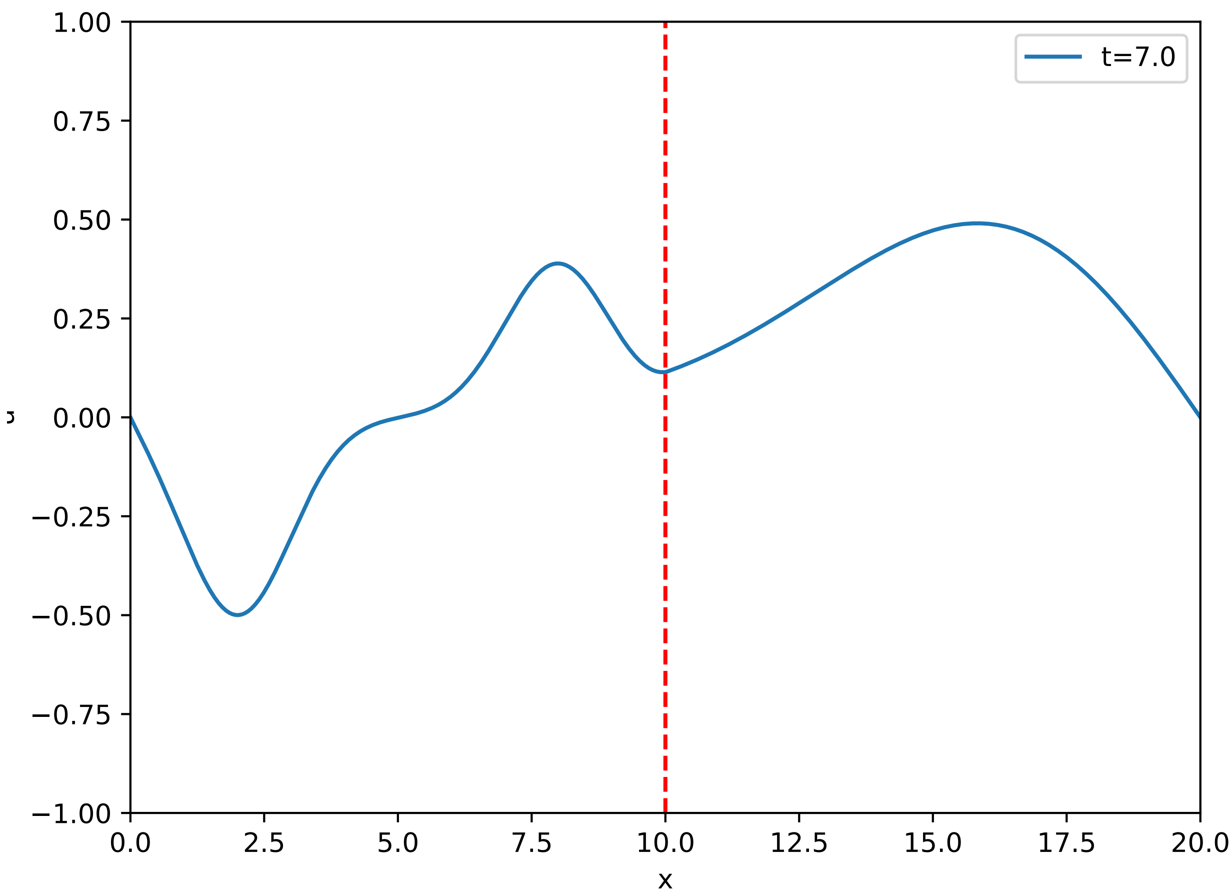

Figure 9: Caption

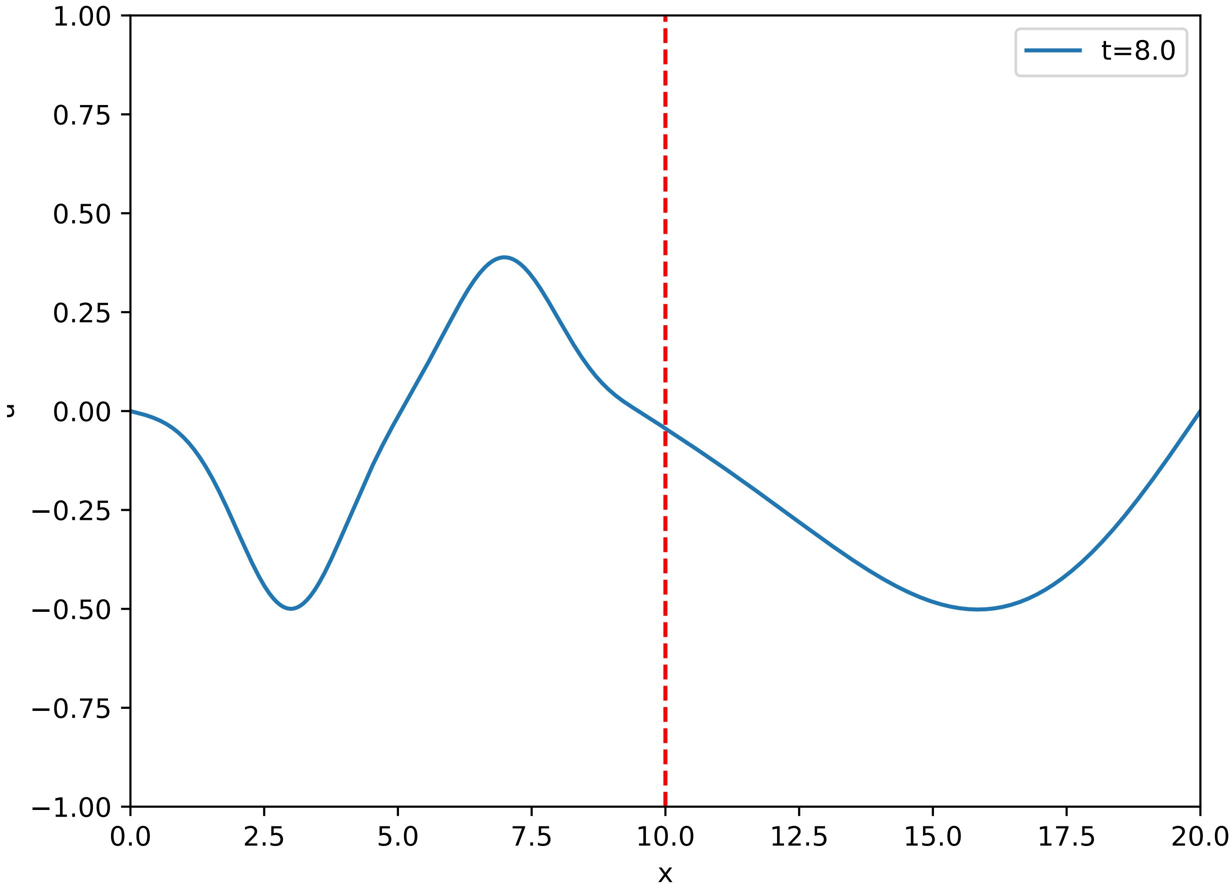

Figure 10: Caption

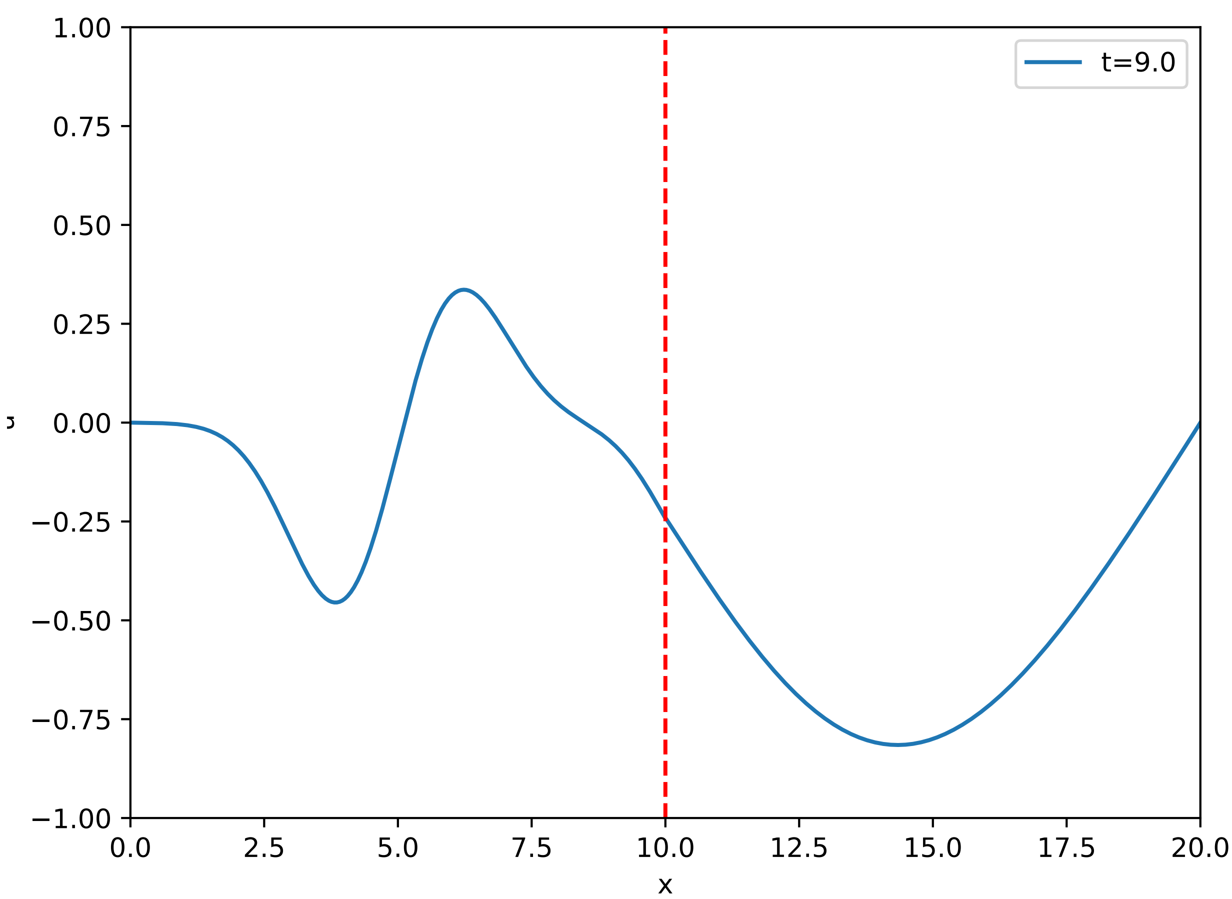

Figure 11: Caption

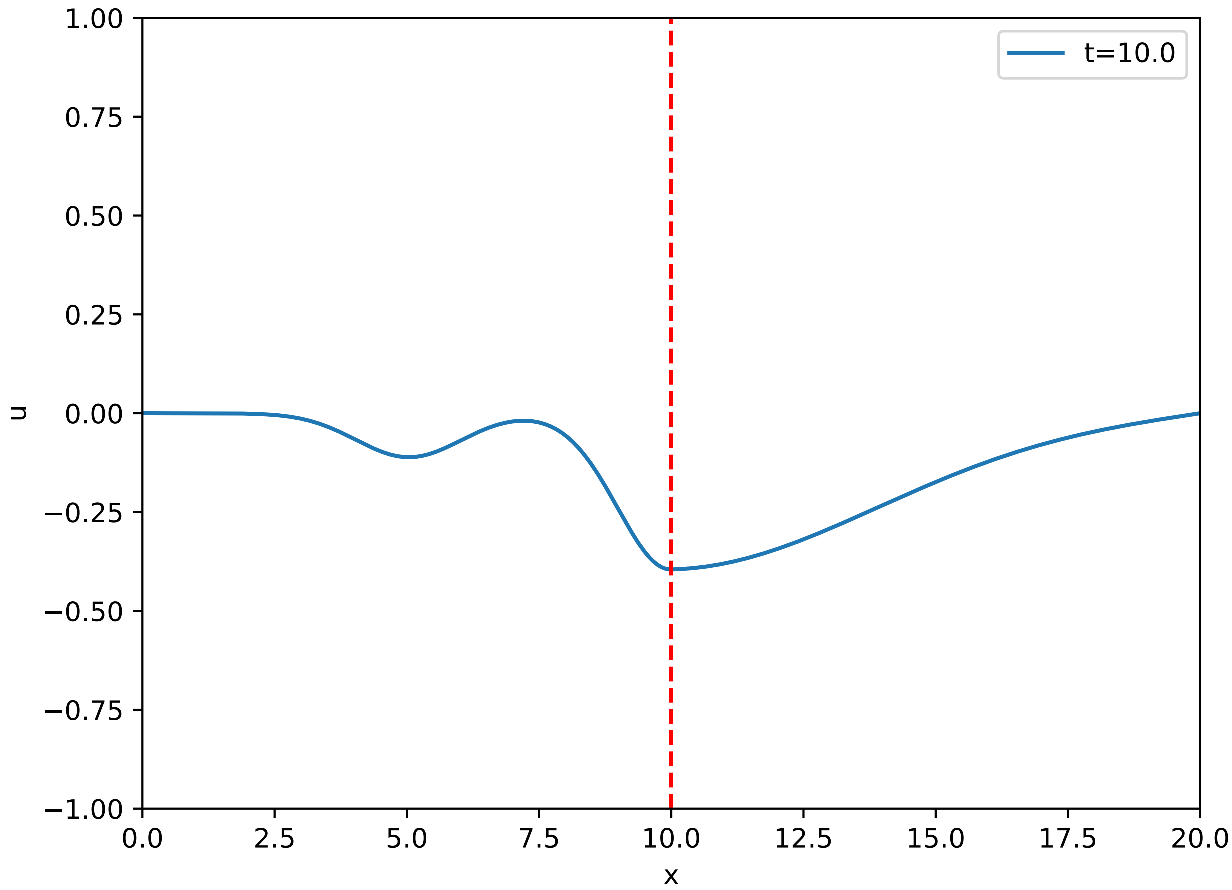

Figure 12: Caption

1.2 $c_1 > c_2$

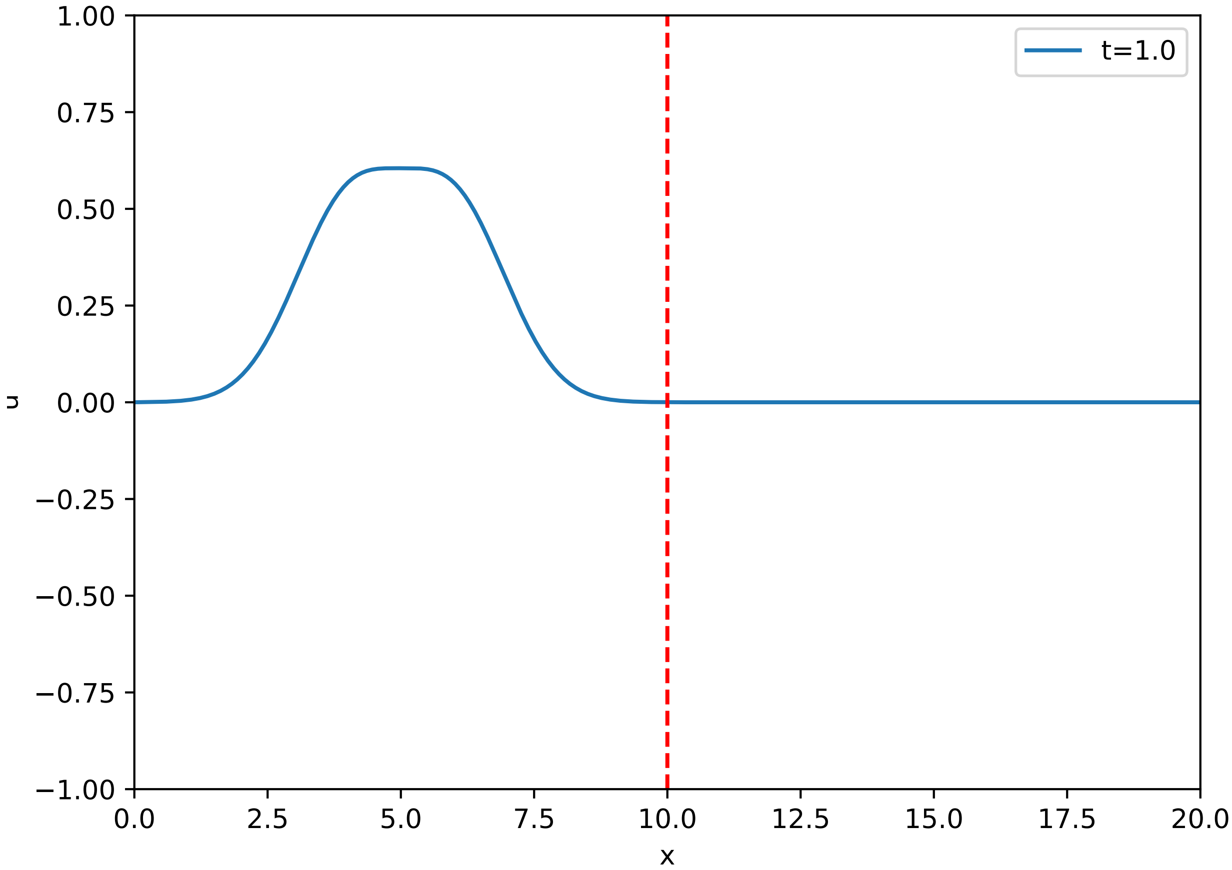

Figure 13: $c_1 = 1, c_2 = 1/2$

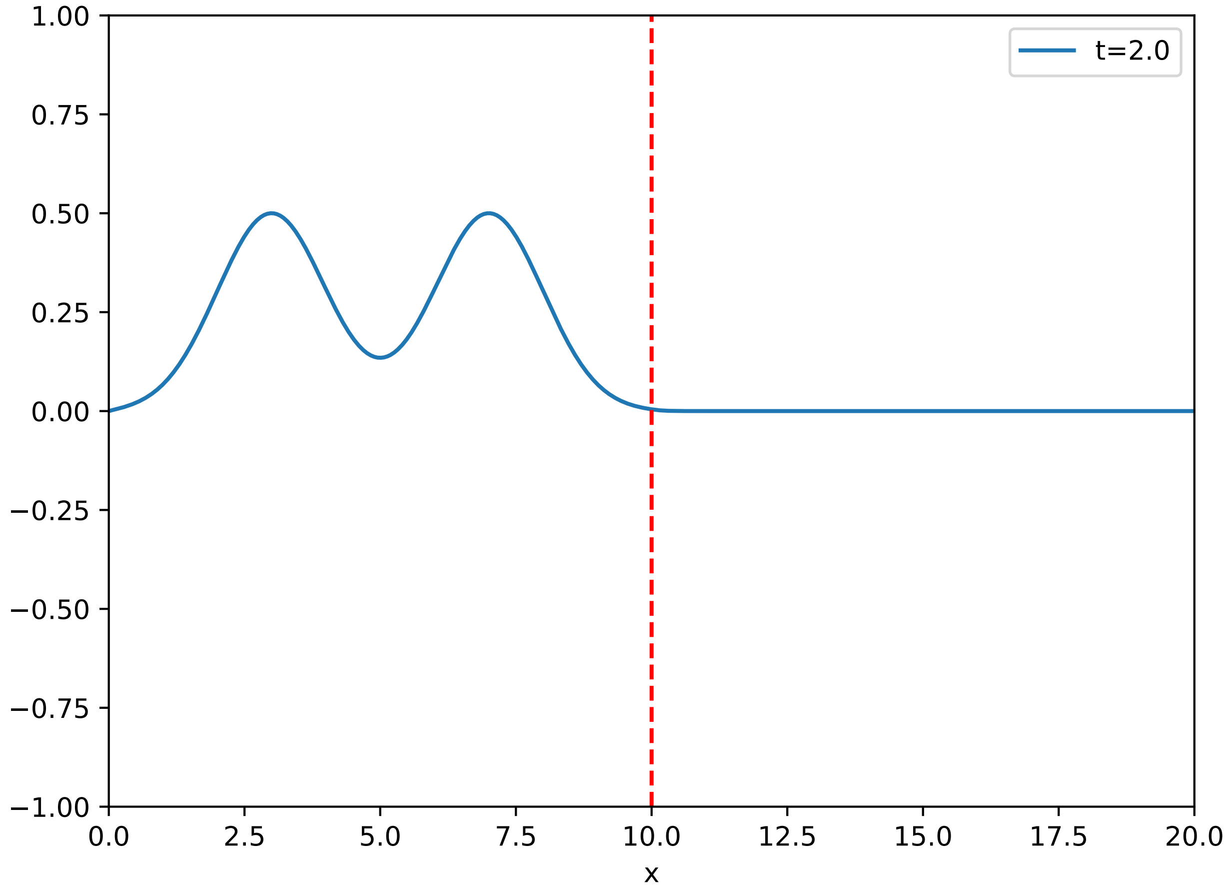

Figure 14: Caption

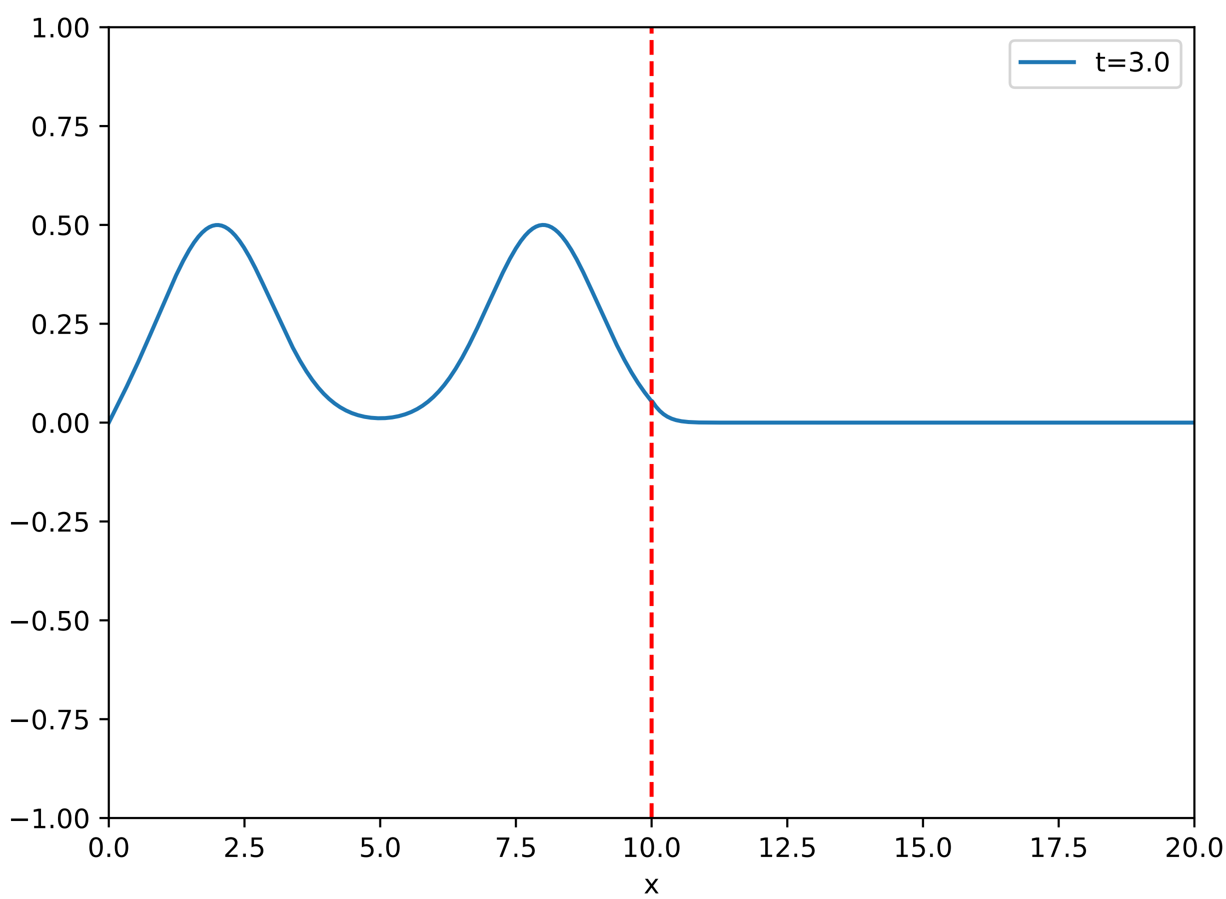

Figure 15: Caption

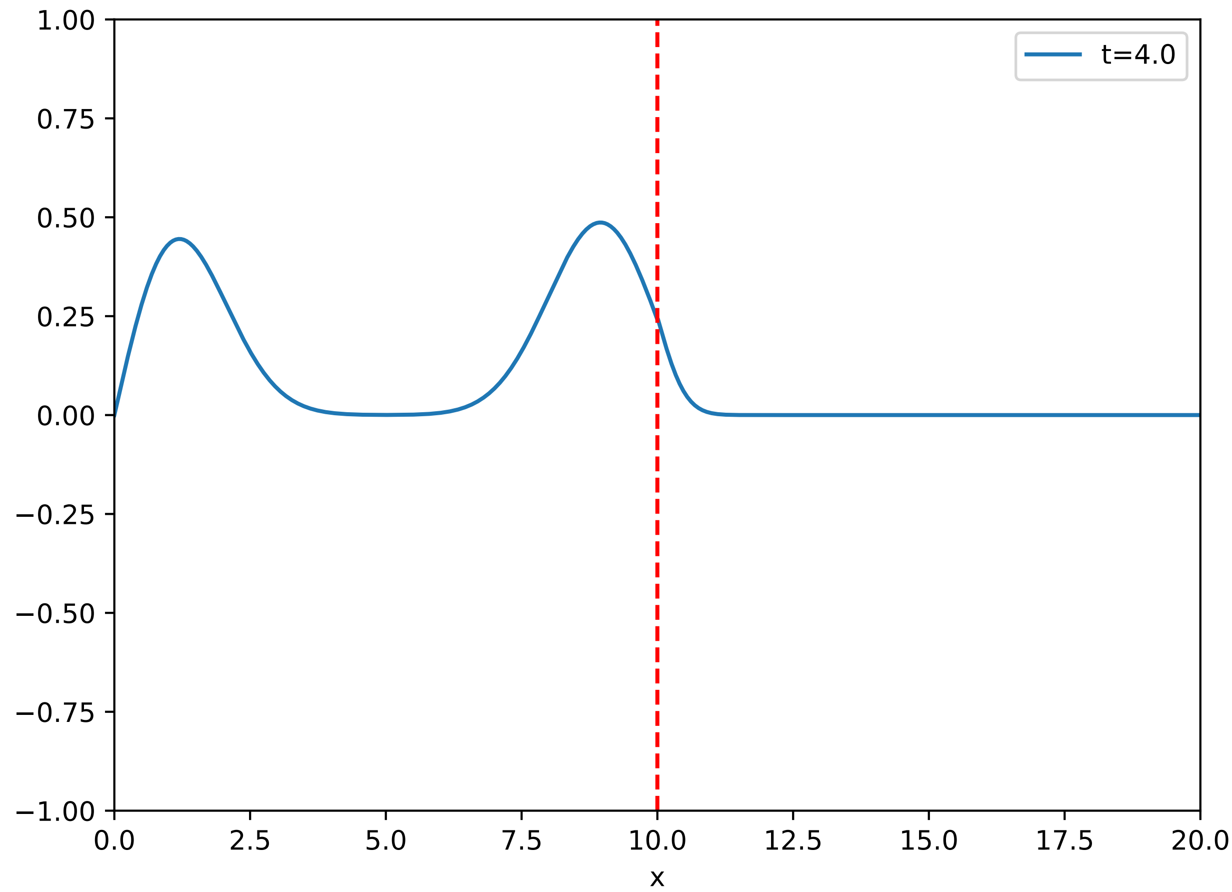

Figure 16: Caption

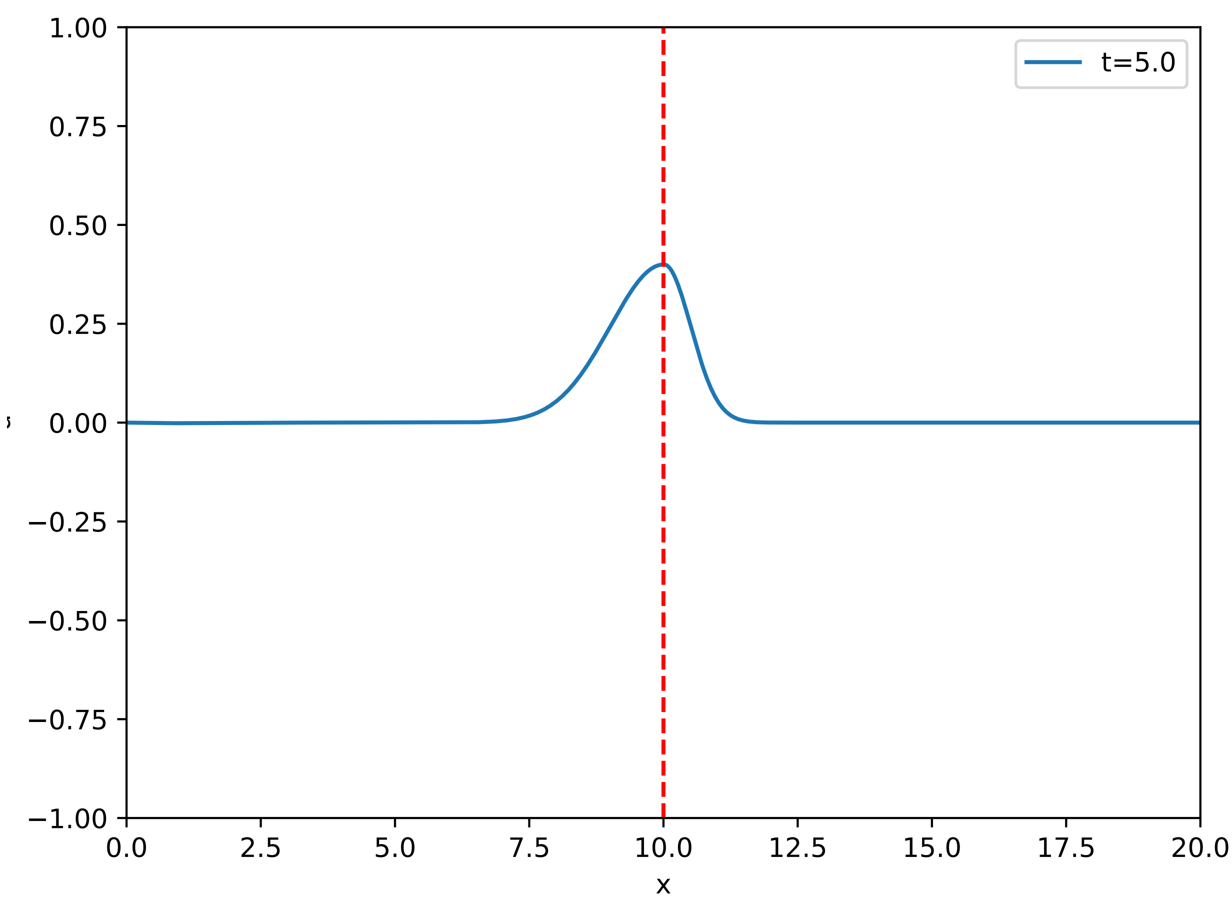

Figure 17: Caption

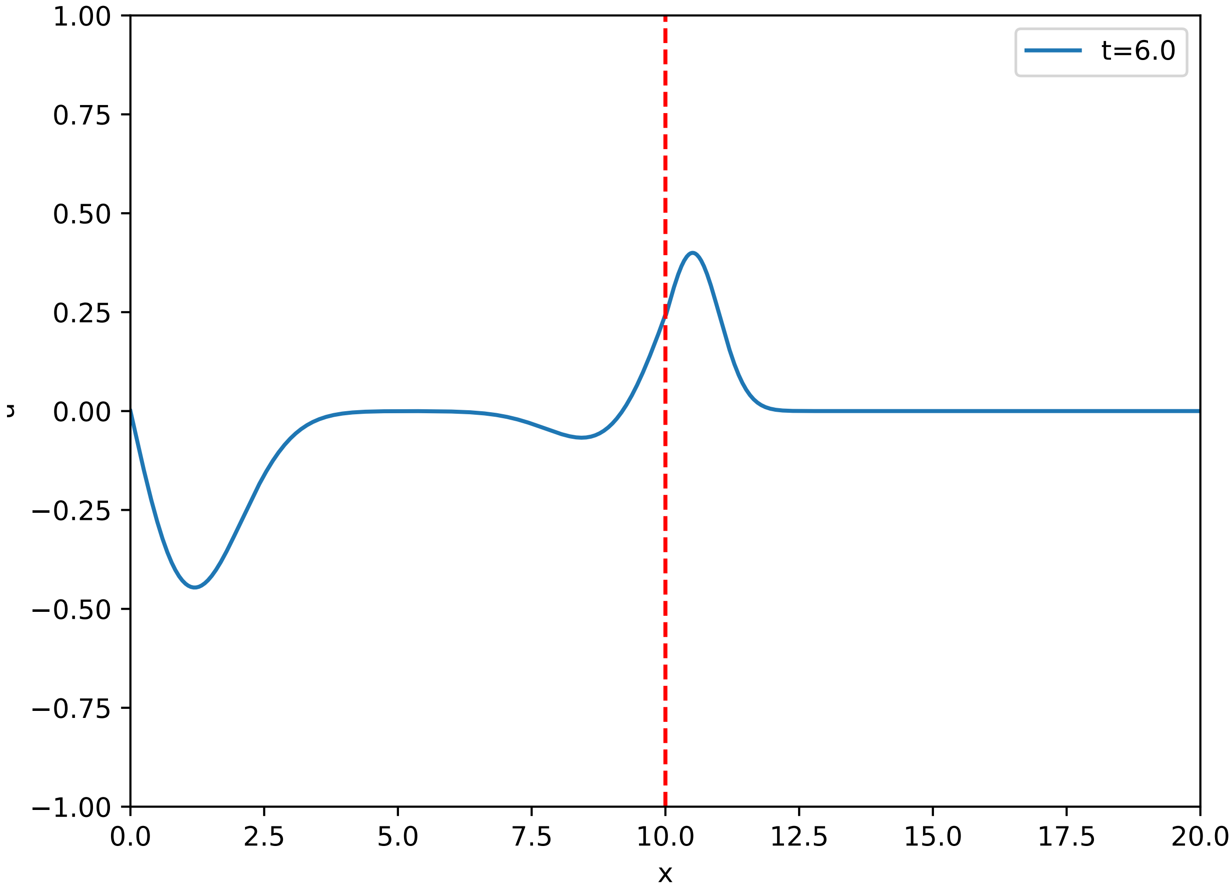

Figure 18: Caption

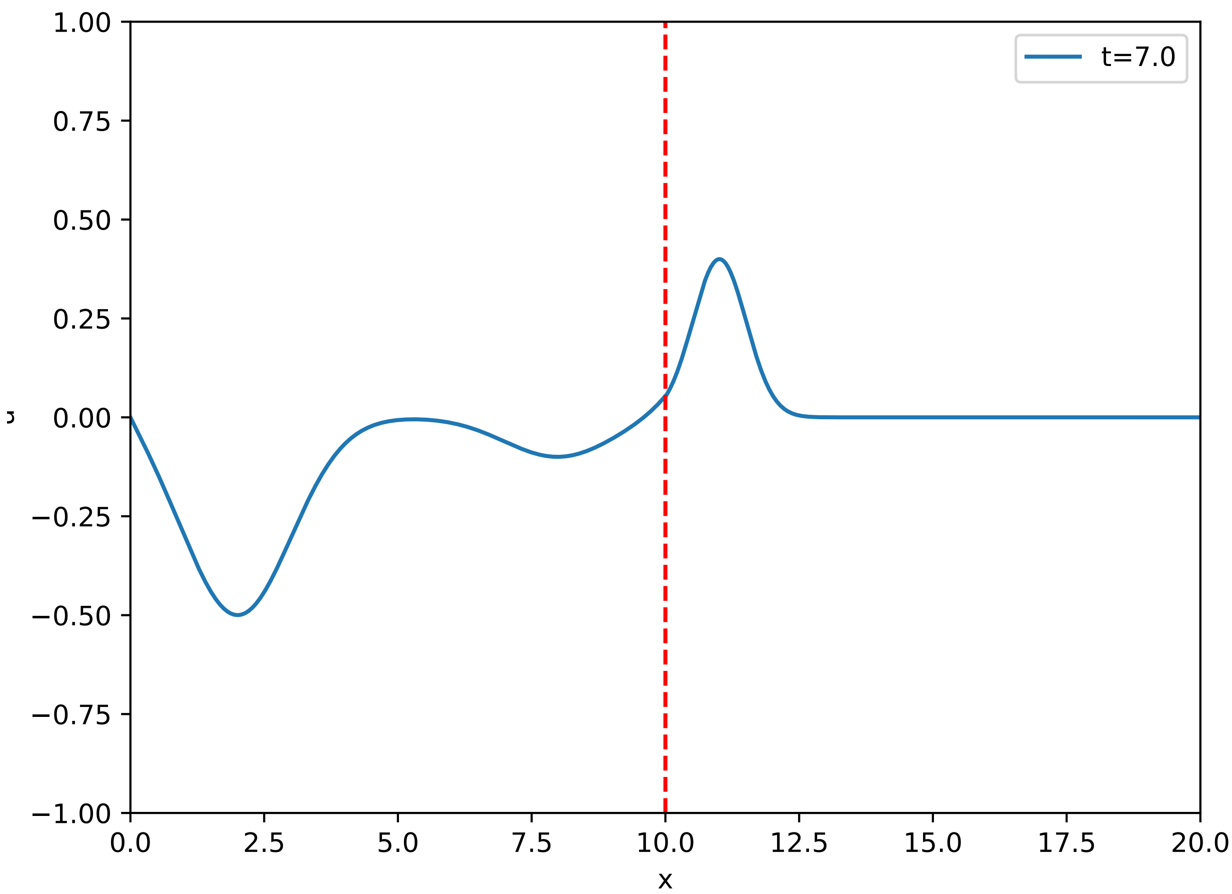

Figure 19: Caption

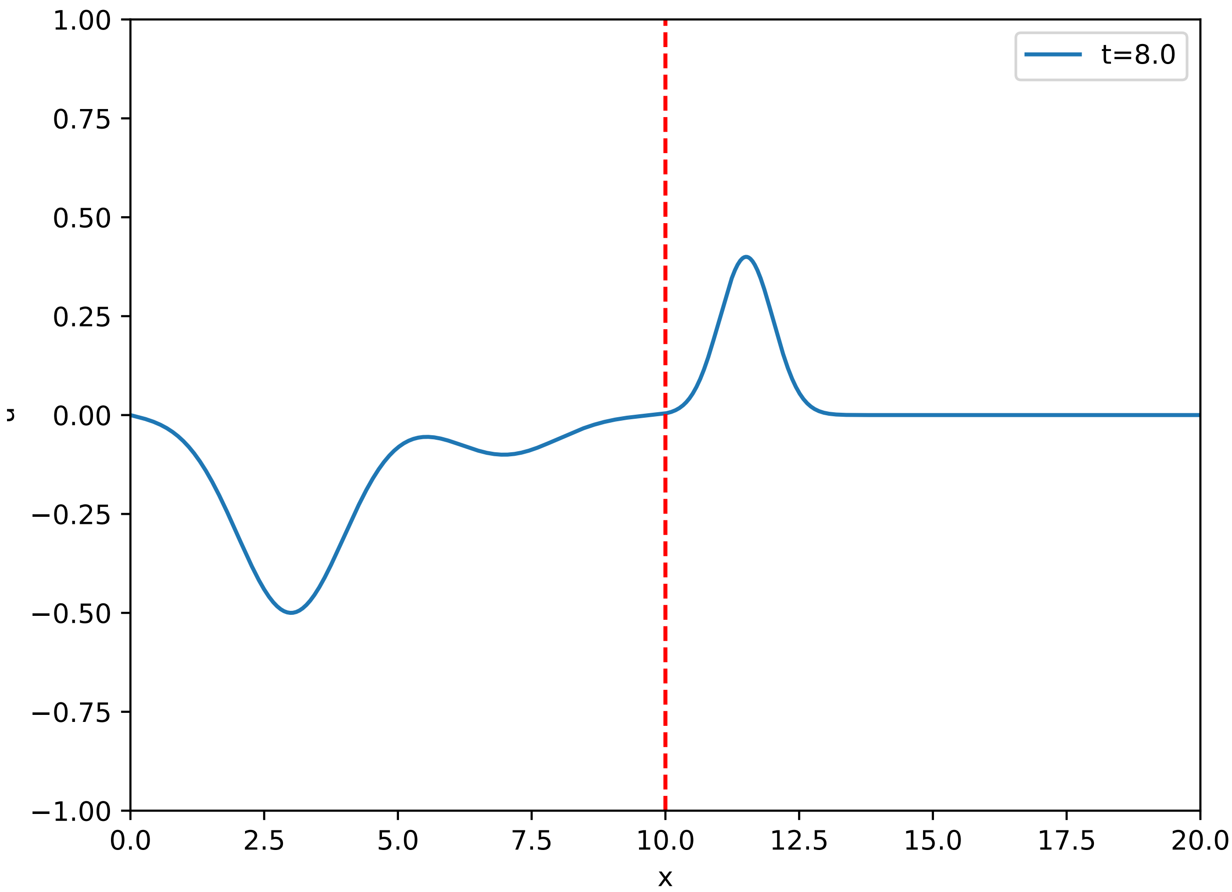

Figure 20: Caption

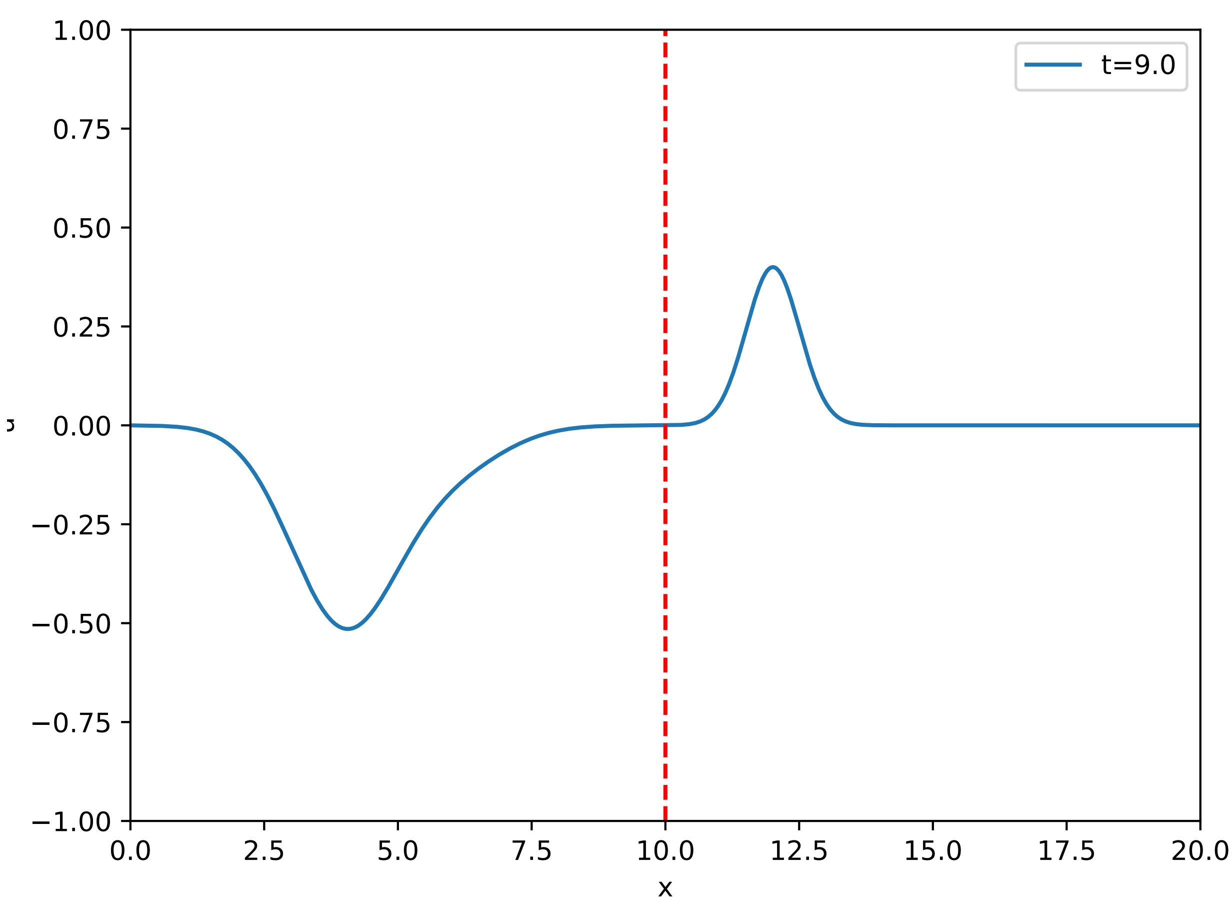

Figure 21: Caption

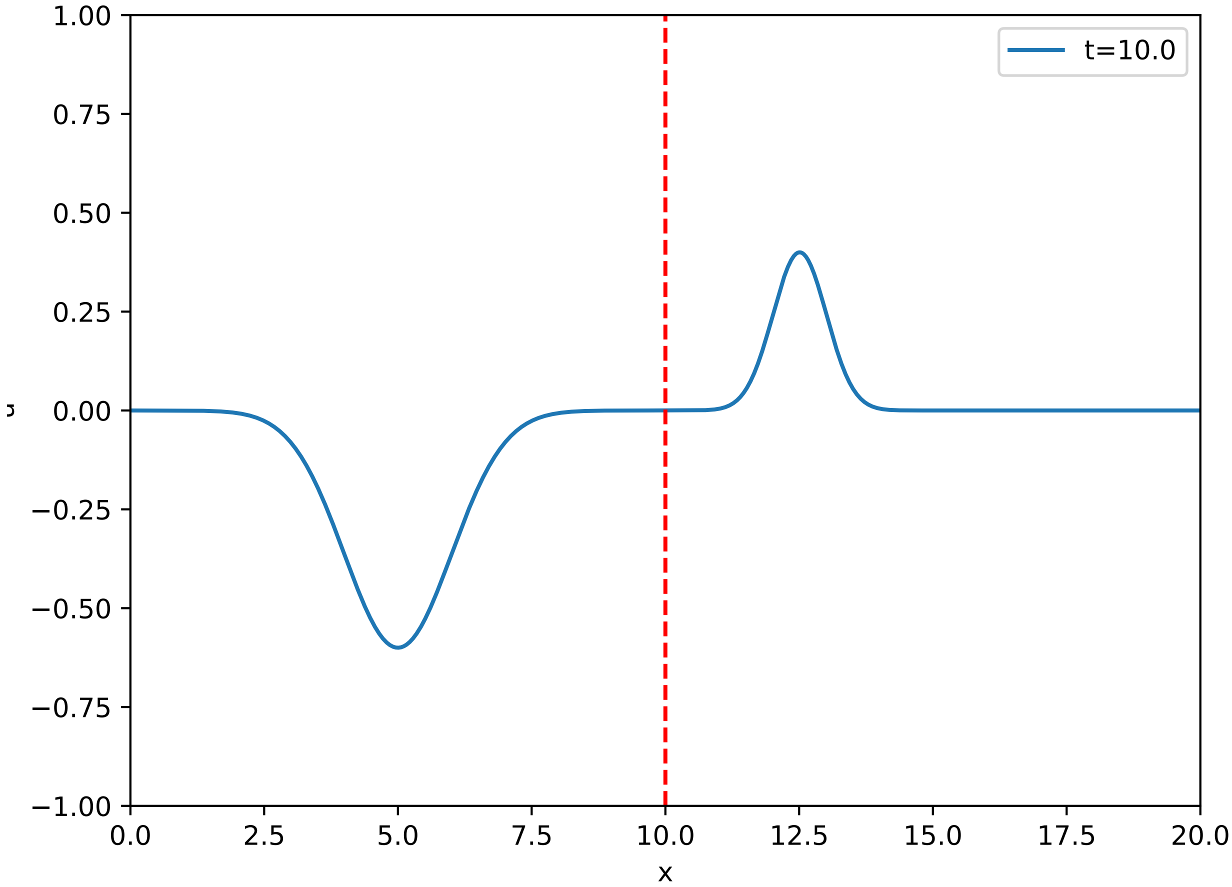

Figure 22: Caption

2 2D Wave Equation

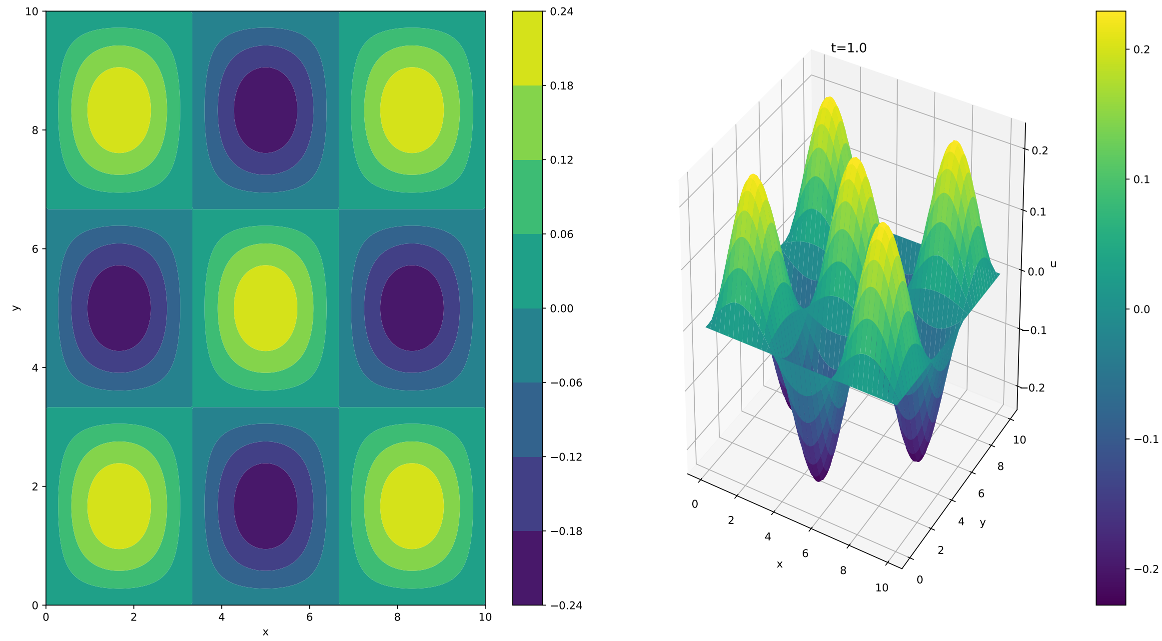

Figure 23: Caption

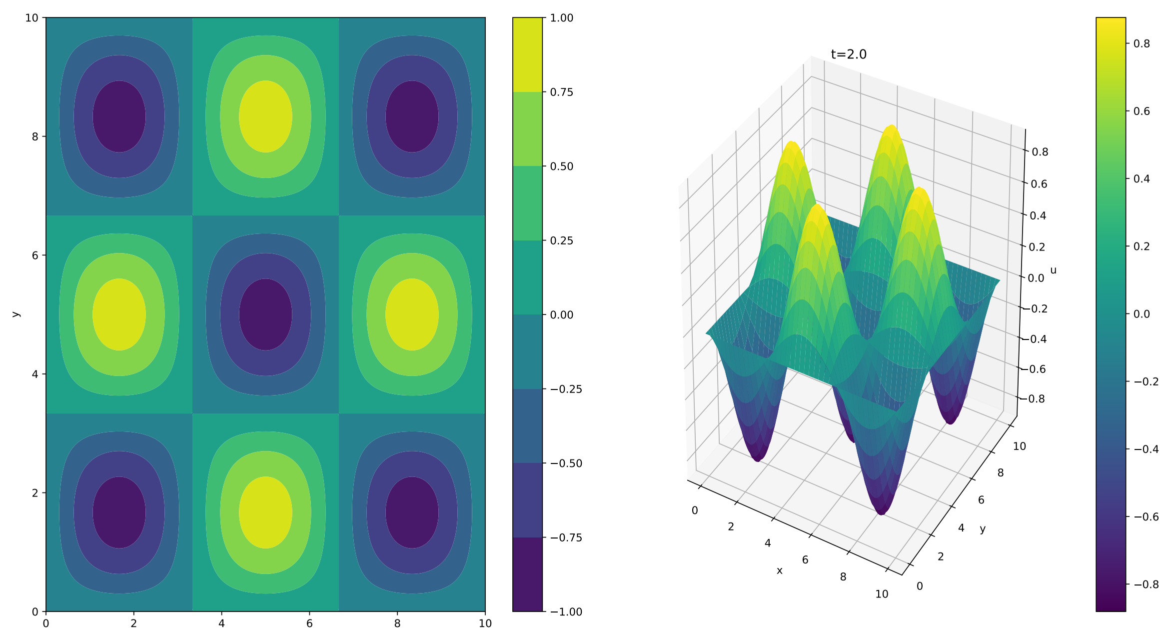

Figure 24: Caption

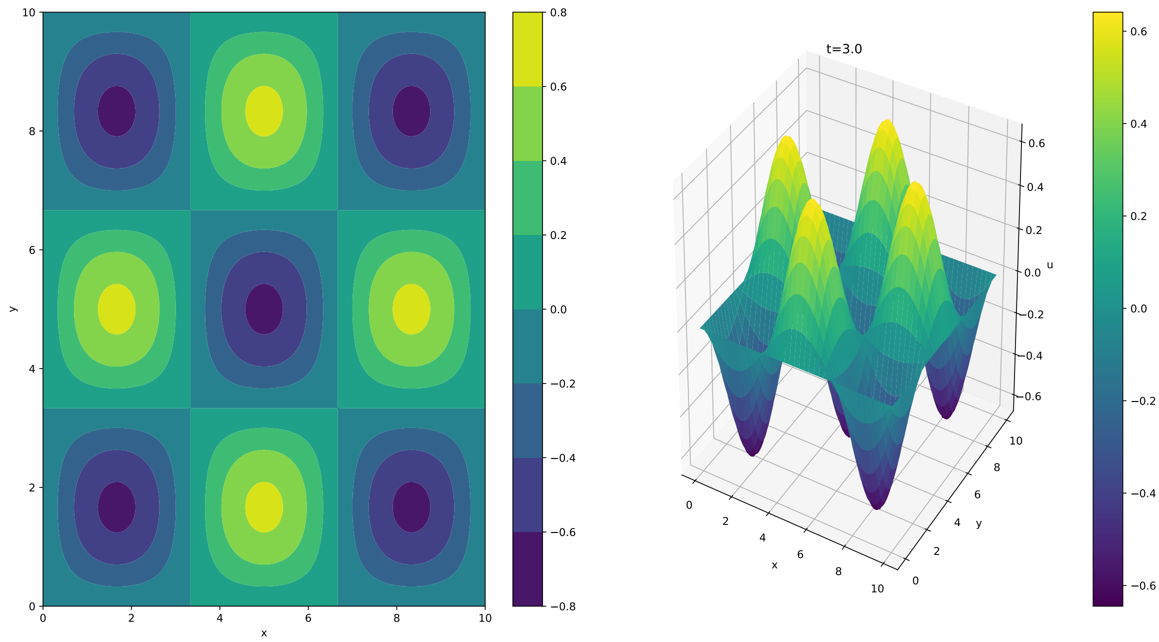

Figure 25: Caption

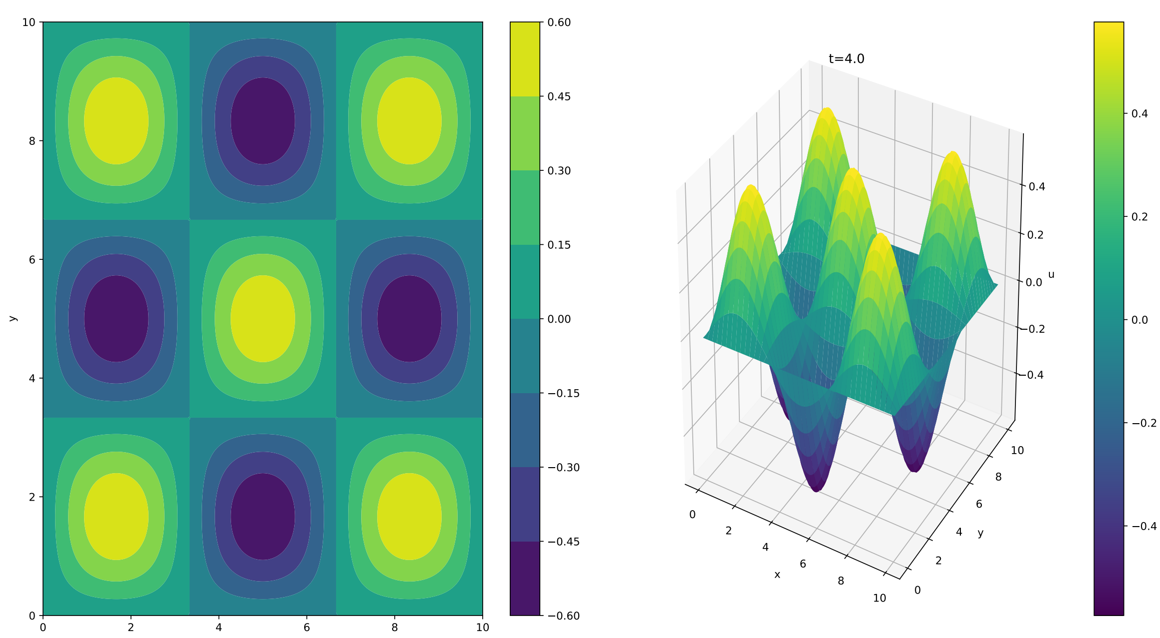

Figure 26: Caption

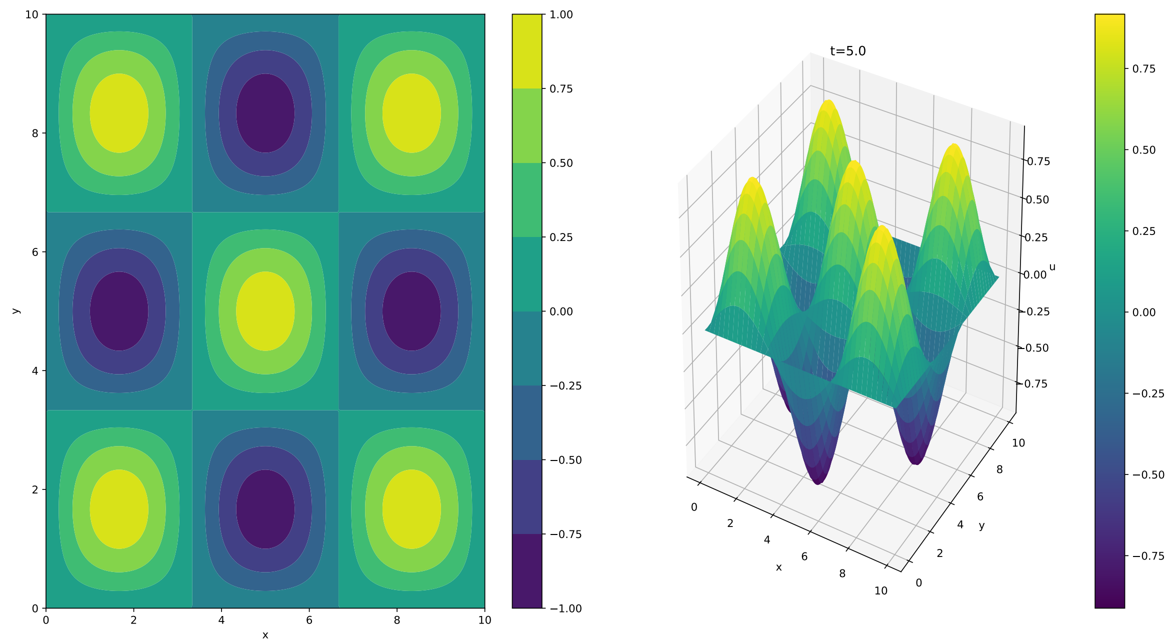

Figure 27: Caption

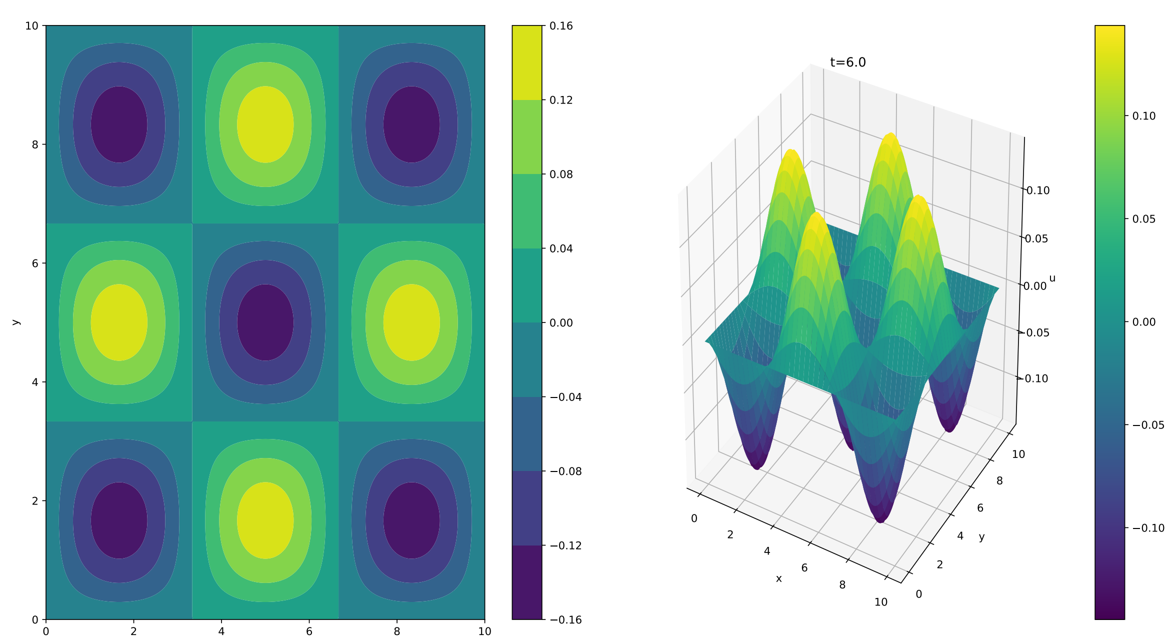

Figure 28: Caption

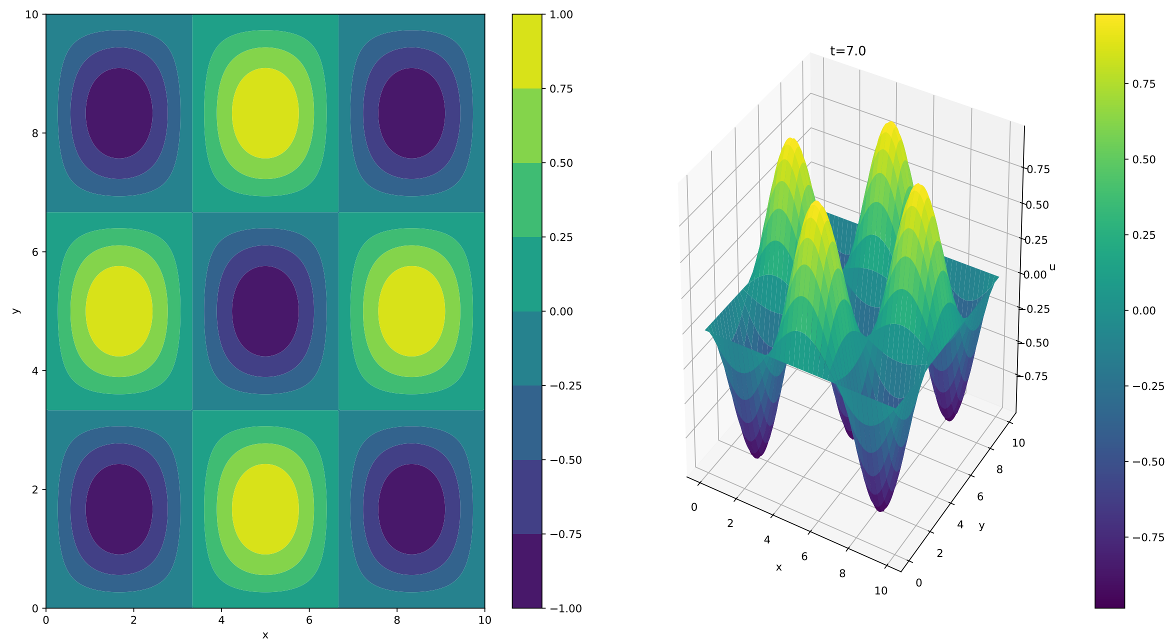

Figure 29: Caption

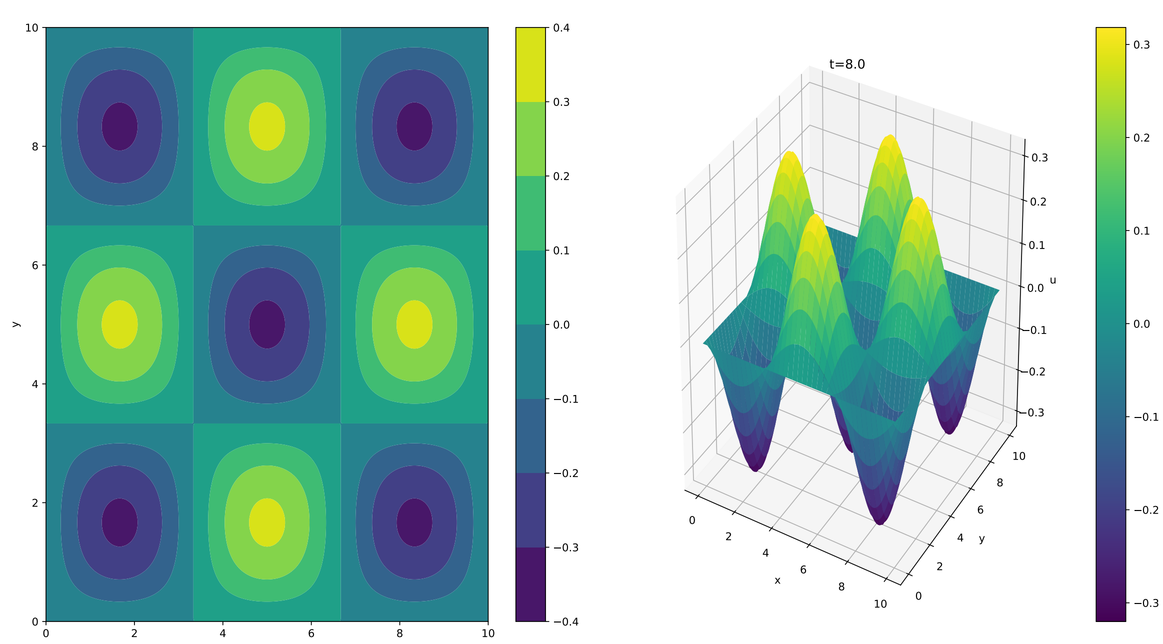

Figure 30: Caption

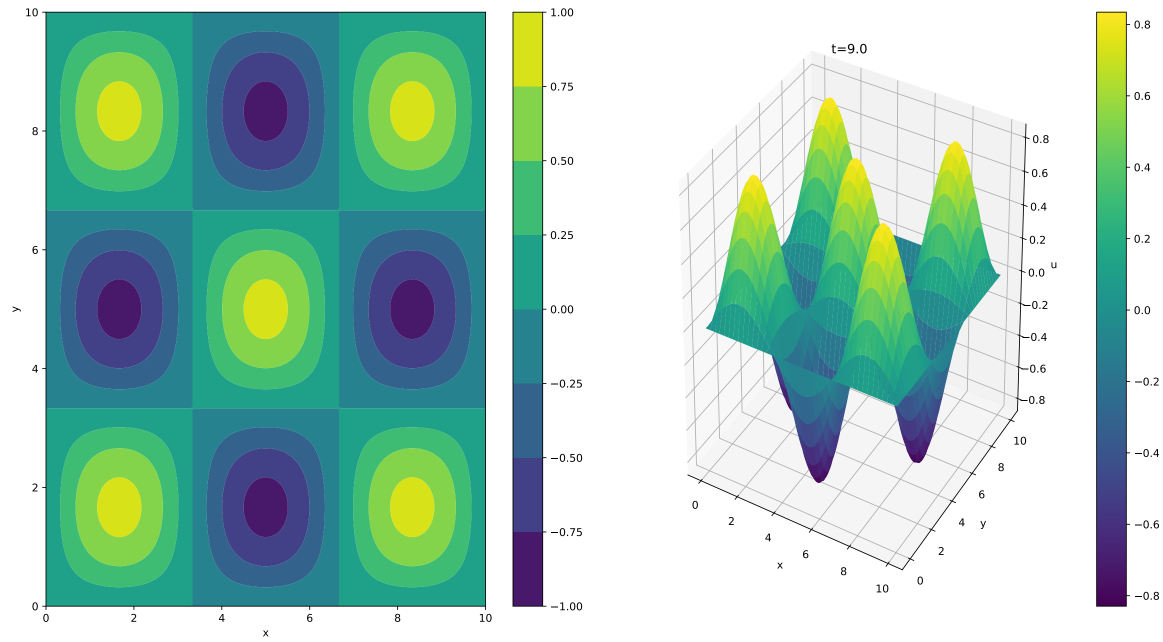

Figure 31: Caption

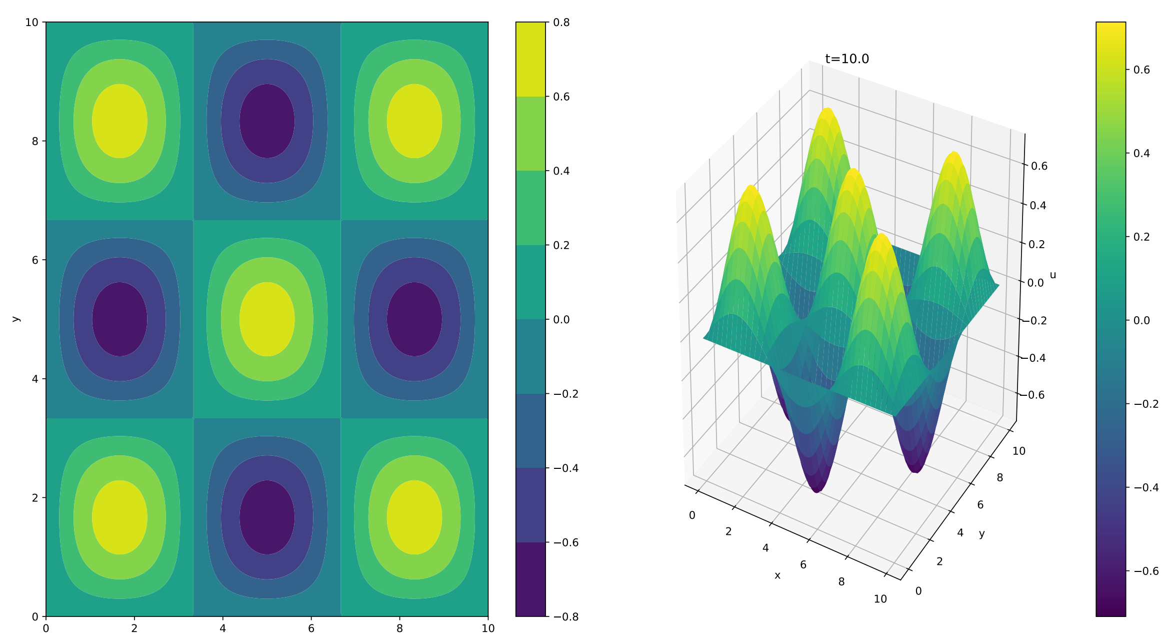

Figure 32: Caption

3 FDTD Test

Figure 33 shows a Gaussian pulse hitting a perfect magnetic conductor. All constants in Maxwell's equations are 1 here.

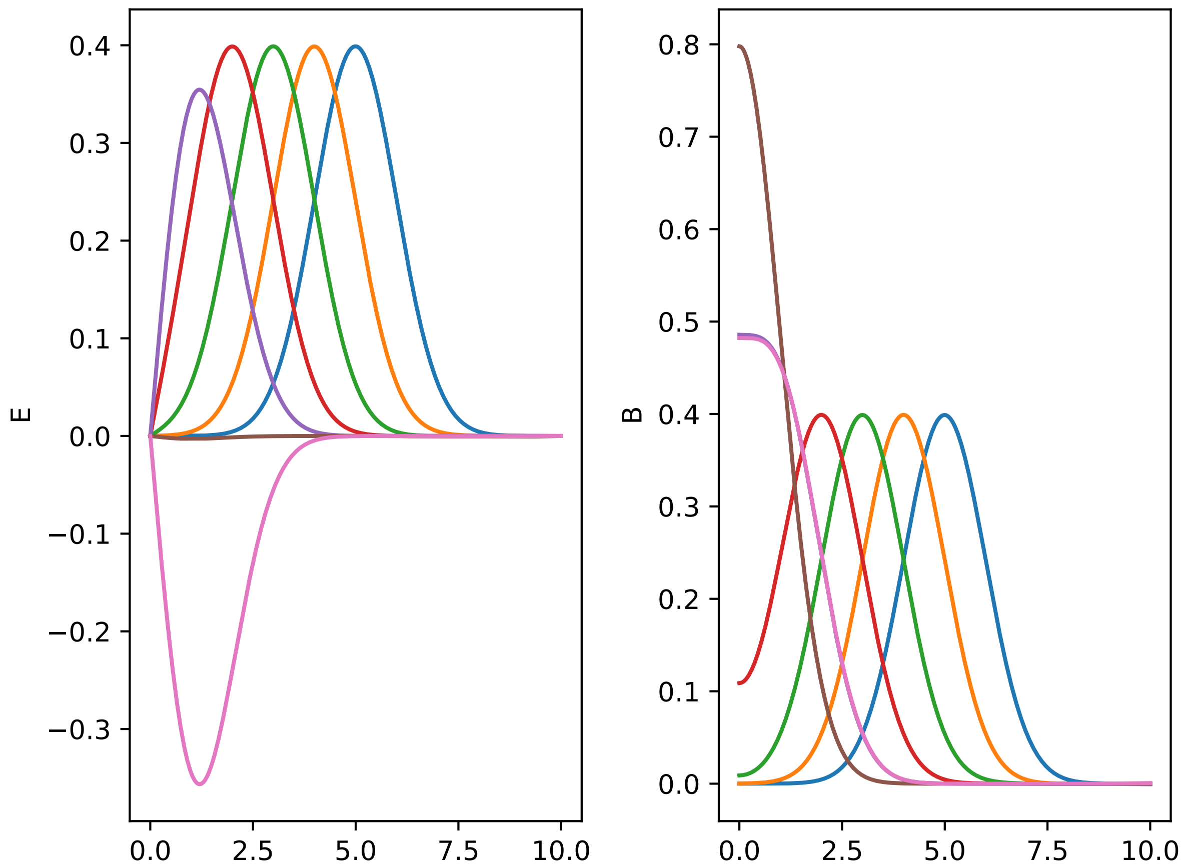

Figure 33: Caption