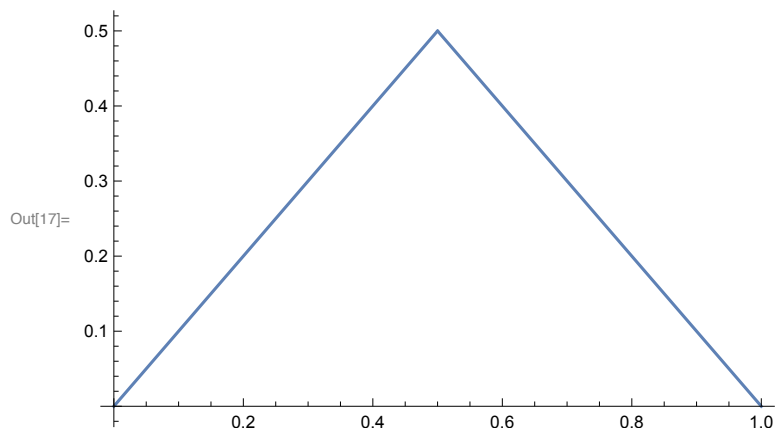


```
In[16]:=  $\psi_0[x_] := \begin{cases} x & 0 \leq x \leq \frac{1}{2} \\ 1-x & \frac{1}{2} < x \leq 1 \end{cases}$ 
```

```
In[17]:= Plot[ $\psi_0[x]$ , {x, 0, 1}]
```



```
In[40]:= diffEq = D[ $\psi[x, t]$ , t] == D[ $\psi[x, t]$ , {x, 2}]
```

```
Out[40]=  $\psi^{(0,1)}[x, t] == \psi^{(2,0)}[x, t]$ 
```

```
In[41]:= bc0 =  $\psi[0, t] == 0$ 
```

```
Out[41]=  $\psi[0, t] == 0$ 
```

```
In[42]:= bc1 =  $\psi[1, t] == 0$ 
```

```
Out[42]=  $\psi[1, t] == 0$ 
```

```
In[45]:= bc2 =  $\psi[x, 0] == \psi_0[x]$ 
```

```
Out[45]=  $\psi[x, 0] == \begin{cases} x & 0 \leq x \leq \frac{1}{2} \\ 1-x & \frac{1}{2} < x \leq 1 \\ 0 & \text{True} \end{cases}$ 
```

```
In[47]:= sol = DSolve[{diffEq, bc0, bc1, bc2},  $\psi[x, t]$ , {x, t}]
```

```
Out[47]=  $\left\{ \left\{ \psi[x, t] \rightarrow \sum_{K[1]=1}^{\infty} \frac{4 e^{-\pi^2 t K[1]^2} \text{Sin}\left[\frac{1}{2} \pi K[1]\right] \text{Sin}[\pi x K[1]]}{\pi^2 K[1]^2} \right\} \right\}$ 
```

```
In[12]:= f[x_, t_] :=  $\sum_{k=1}^{100} \frac{4 e^{-\pi^2 t k^2} \text{Sin}\left[\frac{\pi}{2} k\right] \text{Sin}[\pi x k]}{\pi^2 k^2}$ 
```

```
In[27]:= Plot[{f[x, 0], f[x,  $\frac{1}{9}$ ], f[x,  $\frac{2}{9}$ ], f[x,  $\frac{3}{9}$ ]}, {x, 0, 1},  
PlotRange -> {0, 0.5}, AxesLabel -> {"x", " $\psi(x,t)$ "}, PlotLegends -> Automatic]
```

