```
> soln:=(x,t)->piecewise(x<c*t,0,exp(-(x-c*t)));
```

$$soln := (x, t) \mapsto \begin{cases} 0 & x < c\,t \\ e^{-x+c\,t} & \textit{otherwise} \end{cases}$$

Next we place the assumptions on a, ct and b.

```
> assume(a<c*t,c*t<b);
```

Now integrate u. Remember ~ is Maple's notation to remind us that there are assumptions on these variables.

```
> int(soln(x,t),x=a..b);
```

$$1 - e^{c \sim t \sim - b \sim}$$

```
> diff(%,t);
```

$$-c \sim e^{c \sim t \sim - b \sim}$$

The flux is

```
> phi:=u->c*u;
```

$$\phi := u \mapsto c\,u$$

and so

```
> phi(soln(a,t))-phi(soln(b,t));
```

$$-c \sim e^{c \sim t \sim - b \sim}$$

Therefore we have our result. We can now remove the assumptions.

```
> a:='a':b:='b':c:='c':t:='t':
```