

```
> (2/Pi)*(int((x/(Pi/2))*cos(n*x),x=0..(Pi/2)) + int(((Pi-x)/(Pi/2))*cos(n*x),x=(Pi/2)..Pi));
```

$$\frac{2 \left(\frac{n \sin\left(\frac{\pi n}{2}\right) \pi + 2 \cos\left(\frac{\pi n}{2}\right) - 2}{\pi n^2} - \frac{n \sin\left(\frac{\pi n}{2}\right) \pi + 2 \cos(\pi n) - 2 \cos\left(\frac{\pi n}{2}\right)}{\pi n^2} \right)}{\pi} \quad (1)$$

```
> simplify(%);
```

$$-\frac{8 \cos\left(\frac{\pi n}{2}\right) \left(\cos\left(\frac{\pi n}{2}\right) - 1\right)}{\pi^2 n^2} \quad (2)$$

```
> a := n -> (2/Pi)*(int((x/(Pi/2))*cos(n*x),x=0..(Pi/2)) + int(((Pi-x)/(Pi/2))*cos(n*x),x=(Pi/2)..Pi));
```

$$a := n \mapsto \frac{2 \left(\int_0^{\frac{\pi}{2}} \frac{2 x \cos(n x)}{\pi} dx + \int_{\frac{\pi}{2}}^{\pi} \frac{2 (\pi - x) \cos(n x)}{\pi} dx \right)}{\pi} \quad (3)$$

```
> u := (x,t) -> (1/2)+ sum( a(n)*cos(n*x)*exp(-(n^2)*t),n=1..11);
```

$$u := (x, t) \mapsto \frac{1}{2} + \left(\sum_{n=1}^{11} a(n) \cos(n x) e^{-n^2 t} \right) \quad (4)$$

```
> with(plots):
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> animate( u(x,t), x=0..Pi, t=0..1);
```

