

```
> u:=x->(4/Pi)*sum((1/(2*n+1))*sin((2*n+1)*x),n=0..10);
```

$$u := x \rightarrow \frac{4 \left(\sum_{n=0}^{10} \frac{\sin((2n+1)x)}{2n+1} \right)}{\pi}$$

```
> v:=x->-1+2*Heaviside(x);
```

$$v := x \rightarrow -1 + 2 \operatorname{Heaviside}(x)$$

```
> plot({u(x),v(x)},x=-Pi..Pi,numpoints=500);
```

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

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

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

$$\frac{2 \sin\left(\frac{\pi n}{2}\right) - \sin(\pi n)}{n^2}$$

```
> assume(n,integer);      # comment: Now run those last two commands again.
```

```
> n := 'n';      # comment: This is how I UNASSUME n is an integer
```

$$n := n$$

```
> u:=(x,N)->(4/Pi)*sum((1/(2*n+1))*sin((2*n+1)*x),n=0..N);
```

$$u := (x, N) \rightarrow \frac{4 \left(\sum_{n=0}^N \frac{\sin((2n+1)x)}{2n+1} \right)}{\pi}$$

```
> plot({seq(u(x,N),N=2..6),v(x)},x=-Pi..Pi,numpoints=500);
```