5b. Schrödinger representation

See §2.3.1.

```
In[•]:= Clear[pi, xi]
       pi[ld_, ns[x_, y_, r_], ph_] := E^(I ld (r - 2 xi x - y x)) (ph /. xi → xi + y)
```

```
In[•]:= Clear[x, y, r, x1, y1, r1, ph]
       n = ns[x, y, r]; n1 = ns[x1, y1, r1];
       n2 = n ** n1 //. Gsub;
       pi[ld, n1, ph[xi]]
       pi[ld, n, %]
       % == pi[ld, n2, ph[xi]] // Simplify
```

$$Out[•]= e^{i \, ld \, (r1 - 2 \, x1 \, xi - x1 \, y1)} \, ph[xi + y1]$$

$$Out[•]= e^{i \, ld \, (r - 2 \, x \, xi - x \, y) + i \, ld \, (r1 - 2 \, x1 \, (xi + y) - x1 \, y1)} \, ph[xi + y + y1]$$

$$Out[•]= \text{True}$$

Check of (2.47)

```
In[•]:= D[pi[ld, ns[0, 0, t/2], ph[xi]], t] /. t → 0
       D[pi[ld, ns[t, 0, 0], ph[xi]], t] /. t → 0
       D[pi[ld, ns[0, t, 0], ph[xi]], t] /. t → 0
```

$$Out[•]= \frac{1}{2} \, i \, ld \, ph[xi]$$

$$Out[•]= -2 \, i \, ld \, xi \, ph[xi]$$

$$Out[•]= ph'[xi]$$

```
In[•]:=
```