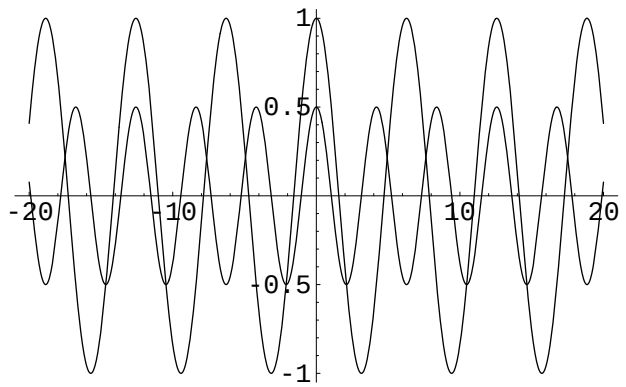
```
(*
 przyklady ponizej podaja zaleznosc miedzy szerokoscia dk,
 a rozmyciem (w jednym wymiarze) paczki falowej
*)

(*
 fala glowna i przesunieta o dk=1/2
 *)
```

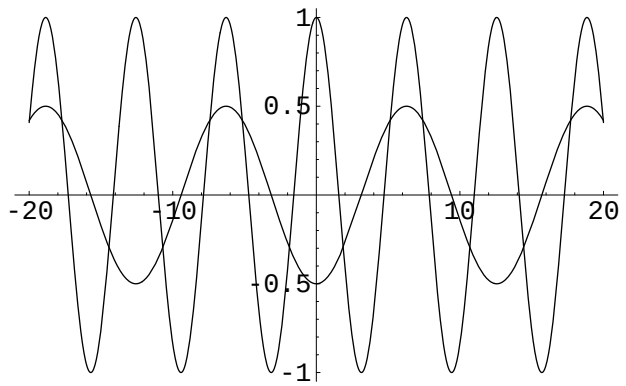
In[2]:=
```
Plot[{Re[dk Exp[I (k x + dk x)] /. k → 1 /. dk → 1 / 2], Re[Exp[I k x] /. k → 1]}, {x, -20, 20}]
```



Out[2]= - Graphics -

```
(*
 fala glowna i przesunieta o dk=-1/2
 *)
```

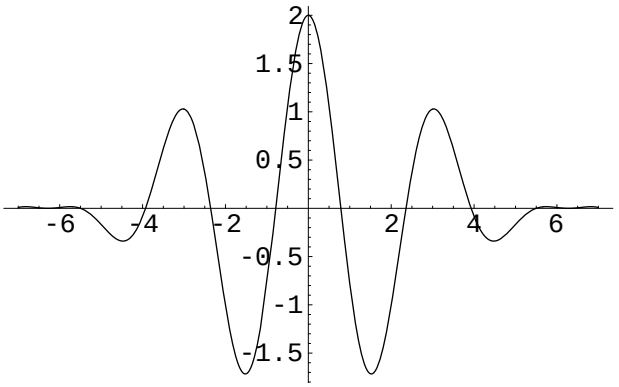
In[3]:=
```
Plot[{Re[dk Exp[I (k x + dk x)] /. k → 1 /. dk → -1 / 2], Re[Exp[I k x] /. k → 1]}, {x, -20, 20}]
```



Out[3]= - Graphics -

```
(*
 superpozycja trzech powyzszych fal dla |dk|=1/2
*)
```

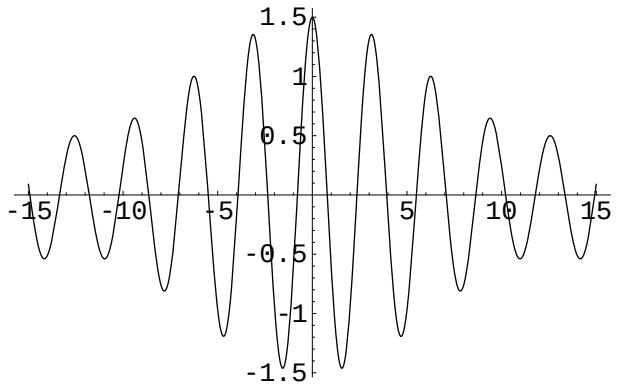
```
In[4]:= Plot[
          (dk Re[Exp[I (k x + dk x)]] + dk Re[Exp[I (k x - dk x)]] + Re[Exp[I (k x)]]) /. k → 2 /. dk → 1 / 2,
          {x, -7, 7}]
```




```
Out[4]= - Graphics -
```

```
(*
 superpozycja trzech fal dla |dk|=
  1/4 : paczka falowa bardziej rozmyta: przedzial okolo -15 do 15
*)
```

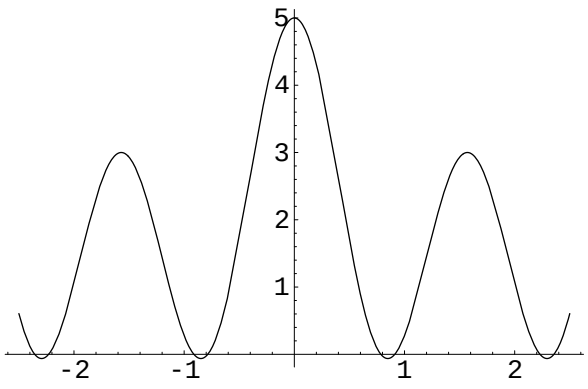
```
In[5]:= Plot[
          (dk Re[Exp[I (k x + dk x)]] + dk Re[Exp[I (k x - dk x)]] + Re[Exp[I (k x)]]) /. k → 2 /. dk → 1 / 4,
          {x, -15, 15}]
```




```
Out[5]= - Graphics -
```

```
(*
 superpozycja trzech fal dla |dk|=
  2 : paczka falowa lepiej zlokalizowana (przedzial okolo -2.5 do 2.5
  *)
```

In[6]:=
```
Plot[(dk Re[Exp[I (k x + dk x)]] + dk Re[Exp[I (k x - dk x)]] + Re[Exp[I (k x)]]) /. k → 2 /. dk → 2
 {x, -2.5, 2.5}]
```



Out[6]= - Graphics -