

## Sheet 8

**Example 1.** a) Plot the function  $f(x) = -\phi(x) + 4\phi(x-1) - 2\phi(x-3)$  by hand.

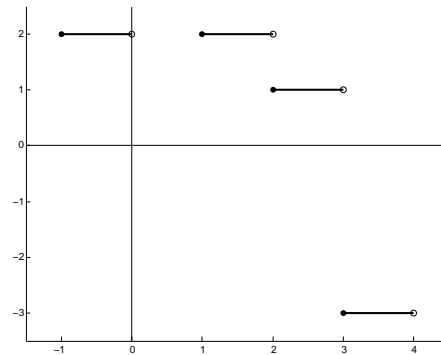
b) Check your answer by having Matlab plot it. For this, use the function

```
phi = @(x) (0<=x)&(x<1);
```

**Example 2.** a) Plot the function  $f(x) = \phi(x+1) + \frac{3}{2}\phi(x) + \frac{1}{2}\phi(x-1) - 2\phi(x-2)$  by hand.

b) Check your answer by having Matlab plot it.

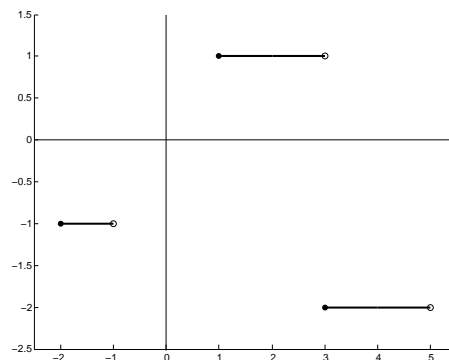
**Example 3.** a) The graph of the function  $f(x)$  is



Write  $f(x)$  in terms of the building blocks  $\{\phi(x), \phi(x \pm 1), \phi(x \pm 2) \dots\}$  of  $V_0$ .

b) Check your answer by having Matlab plot it.

**Example 4.** a) The graph of the function  $f(x)$  is



Write  $f(x)$  in terms of the building blocks of  $V_0$ .

b) Check your answer by having Matlab plot it.

**Example 5.** a) Plot the function  $f(x) = \phi(2x) - 2\phi(2x - 1) - \phi(x - 1) + 2\phi(2x - 5)$  by hand.

b) Check your answer by having Matlab plot it.

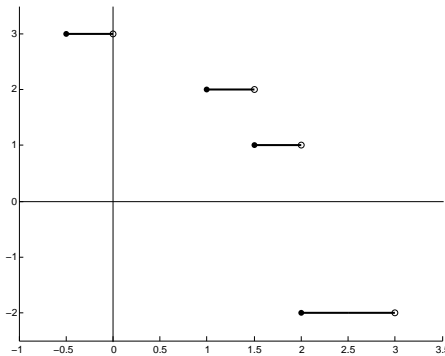
**Example 6.** a) Plot the function

$$f(x) = \phi(2x + 2) + 2\phi(2x - 1) + \frac{1}{2}\phi(2x - 2) - 2\phi(2x - 3) + \frac{1}{2}\phi(2x - 5)$$

by hand.

b) Check your answer by having Matlab plot it.

**Example 7.** a) The graph of the function  $f(x)$  is



Write  $f(x)$  in terms of the building blocks  $\{\phi(2x), \phi(2x \pm 1), \phi(2x \pm 2) \dots\}$  of  $V_1$ . Check your answer by having Matlab plot it.

**Example 8.** Write  $f(x)$  from Example 3 in terms of the building blocks of  $V_1$ . Check your answer by having Matlab plot it.

**Example 9.** Write  $f(x)$  from Example 4 in terms of the building blocks of  $V_1$ . Check your answer by having Matlab plot it.

**Example 10.** You know the graph of  $f(x)$  from Example 1. Use it to write  $f(x)$  in terms of the building blocks of  $V_1$ . Check your answer by having Matlab plot it.

**Example 11.** Plot the function  $f(x) = -2\phi(4x + 3) + \phi(4x + 1) - 3\phi(4x) + \frac{3}{2}\phi(4x - 1)$  by hand and check your answer with Matlab.

**Example 12.** You know the graph of  $f(x)$  from Example 5. Use it to write  $f(x)$  in terms of the building blocks of  $V_2$  and check your answer by having Matlab plot it.