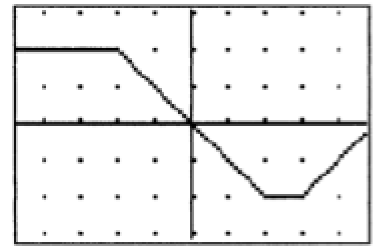
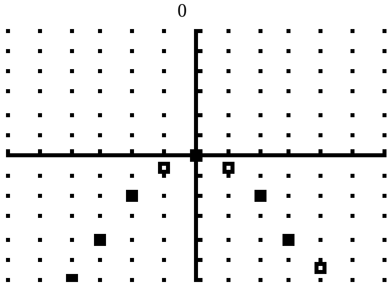
The graph of $f(t)$ is shown at right. Assume that $1\text{ tick} = 1\text{ unit}$.
Use the concept of accumulated area to draw a sketch of the following:



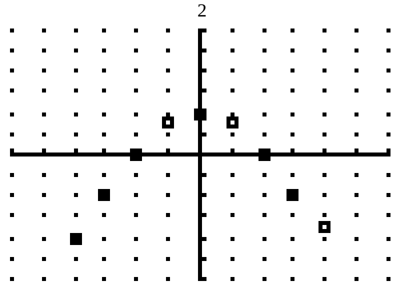
Graph of f(t)

x	–4	–3	–2	–1	0	1	2	3	4
$g(x)$	–6	–4	–2	–0.5	0	–0.5	–2	–4	–5.5
$h(x)$	–4	–2	0	1.5	2	1.5	0	–2	–3.5
$k(x)$	0	2	4	5.5	6	5.5	4	2	0.5

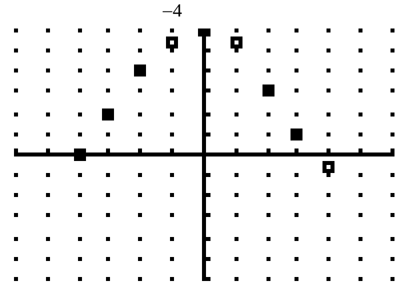
(a) $g(x) = \int_0^x f(t)\,dt$



(b) $h(x) = \int_2^x f(t)\,dt$



$k(x) = \int_{-4}^x f(t)\,dt$



1. When does $g(x)$ reach a maximum? Justify your answer.

$g(x)$ achieves a maximum when $g'(x) = f(x)$ changes sign from positive to negative, at $x = 0$

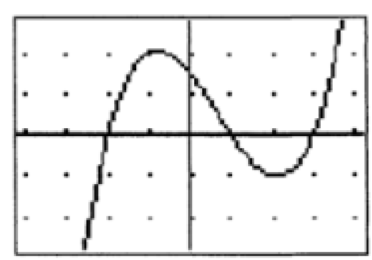
2. When does $h(x)$ reach a maximum? Justify your answer.

$h(x)$ achieves a maximum when $h'(x) = f(x)$ changes sign from positive to negative, at $x = 0$

3. When is the graph of $k(x)$ concave down? Justify your answer.

$k(x)$ is concave down when $k''(x) = f'(x)$ is less than zero. This occurs on the interval $(-2, 2)$.

Let $f(t)$ be the function shown at right. Let $q(x) = \int_{-2}^x f(t)\,dt$.



f(t)

4. Which is greater? $q(-1)$ or $q(2)$ ::: $q(2)$

5. Which is greater? $\underbrace{q'(-1)}_{f(-1)}$ or $\underset{f(2)}{q'(2)}$ ::: $q'(-1)$

6. Which is greater? $\underbrace{q''(-1)}_{f'(-1)}$ or $\underset{f'(2)}{q''(2)}$ ::: $q''(-1)$