## Graphs of Functions

1. The graph of the function $f(x)$ is shown. On separate diagrams sketch the graphs of
(i) $\mathrm{f}(\mathrm{x})+3$
(ii) $-\mathrm{f}(\mathrm{x})$

2. The diagram shows the graph of $y=f(x)$.

Sketch the graph of $y=3-f(x)$.

3. Part of the graph of $y=g(x)$ is shown.

On separate diagrams sketch the graphs Of
(i) $y=-2 g(x)$
(ii) $y=g(x-4)$

4. The graph of $y=g(x)$ is shown.

Sketch the graph of $\mathrm{y}=-\mathrm{g}(\mathrm{x}-2)$.

5. The graph of $y=f(x)$ is shown.

On separate diagrams sketch the graphs of
(i) $y=-1 / 2 f(x)+2$
(ii) $y=f(-x)-2$
6. The graph of $\mathrm{y}=\mathrm{h}(\mathrm{x})$ is shown.

On separate diagrams sketch the graphs of
(i) $y=2 h(-x)$
(ii) $y=h(3 x)-1$

7. The diagram shows the graph of $y=f(x)$.

Sketch the graph of $y=f(1 / 2 x)+3$.

8. (a) $f(x)=x^{2}+4 x+7$. Express $f(x)$ in the form $(x+a)^{2}+b$.
(b) Sketch the graph of $y=f(x)$ showing its turning point and where it cuts the $y$-axis.
(c) Hence sketch the graph of $\mathrm{y}=-\mathrm{f}(\mathrm{x})+3$.
9. (a) $f(x)=x^{2}-6 x+1$. Express $f(x)$ in the form $(x-a)^{2}-b$.
(b) Sketch the graph of $y=f(x)$.
(c) Hence sketch the graph of $y=f(-x)-2$.
10. (a) $f(x)=2 x^{2}+8 x-3$. Express $f(x)$ in the form $a(x+b)^{2}+c$
(b) Sketch the graph of $y=f(x)$.
(c) Hence sketch the graph of $\mathrm{y}=-\mathrm{f}(\mathrm{x}-2)$.

