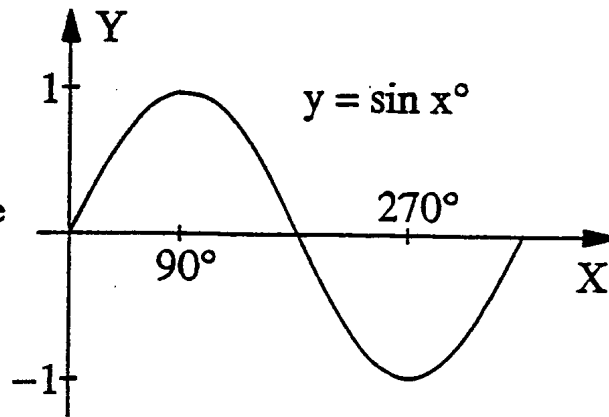
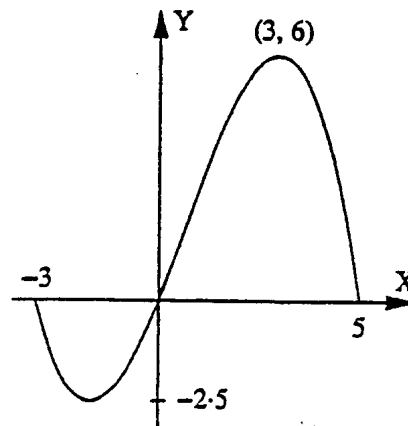


Sketching Graphs.

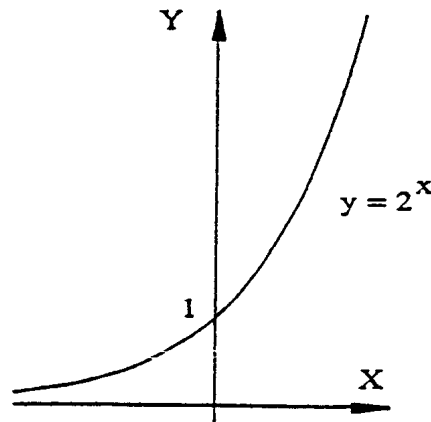
1. The diagram shows the graph of the function
 $f(x) = \sin x^\circ$ for $0 \leq x \leq 360$.
 On separate diagrams, sketch the graphs of the functions:
 a) $3 + f(x)$ b) $-f(x)$
 c) $f(x) - 2$ d) $-4 - f(x)$



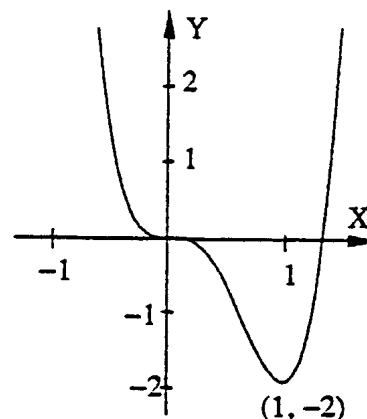
2. The graph of the function
 $y = f(x)$
 is shown in the diagram.
 On separate diagrams, sketch the graphs of
 a) $y = -f(x)$
 b) $y = 2.5 + f(x)$



3. The diagram shows the graph of the function
 $y = 2^x$.
 On separate diagrams, sketch the graphs of
 a) $y = -2^x$
 b) $y = 2^x - 1$
 c) $y = 1 - 2^x$



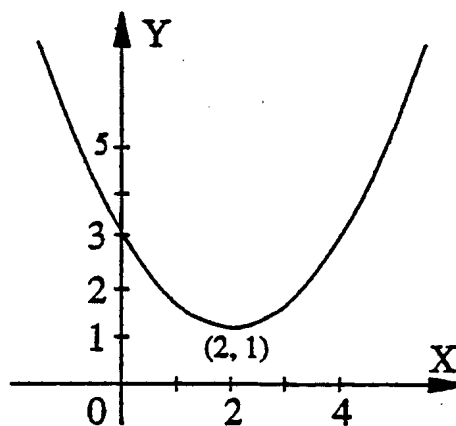
4. The graph of a function with equation
 $y = f(x)$
 is shown in the diagram.
 Draw sketches of the following functions:
 a) $y = -f(x)$
 b) $y = 2 + f(x)$
 c) $y = f(x) - 1$



5. The graph of a quadratic function
 $f(x) = ax^2 + bx + c$
 is shown in the diagram.

On separate diagrams, show the graphs of

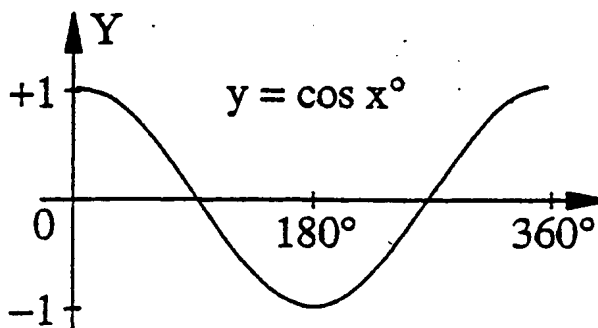
- a) $y = -f(x)$
- b) $y = f(x) - 1$
- c) $y = f(x) - 3$



6. The graph of
 $y = \cos x^\circ$
 is shown in the diagram.

On separate diagrams,
 show the graphs of

- a) $3 + \cos x$
- b) $-\cos x$
- c) $\cos x - 5$
- d) $-\cos x + 1$



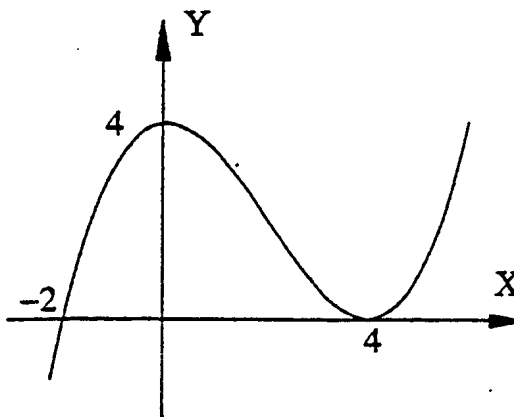
7. The graph of a cubic function is
 shown in the diagram.

If the equation of this function is

$$y = f(x),$$

show on separate diagrams,
 the graphs of

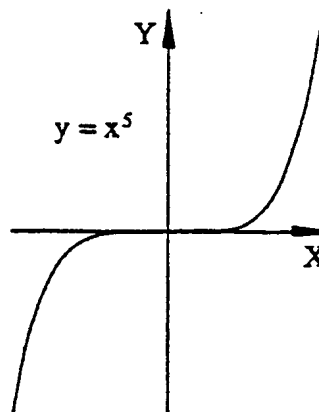
- a) $y = -f(x)$
- b) $y = f(x) - 4$
- c) $y = 4 - f(x)$



8. The graph of $y = x^5$
 is shown in the diagram.

On separate diagrams, show the
 graphs of

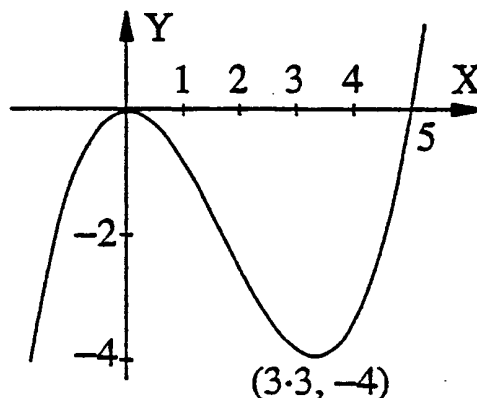
- a) $y = -x^5$
- b) $y = x^5 + 4$
- c) $y = x^5 - 2$
- d) $y = 5 - x^5$



9. The graph of a function with equation $y = f(x)$ is shown in the diagram.

On separate diagrams, show the graphs of

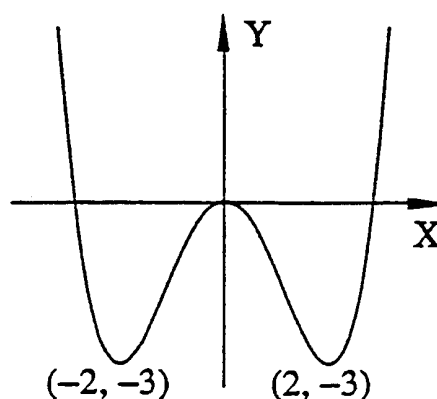
- a) $y = -f(x)$ b) $y = f(x) + 4$
 c) $y = -f(x)$ d) $y = -4 - f(x)$



10. The graph of a function with equation $y = f(x)$ is shown in the diagram.

On separate diagrams, show the graphs of

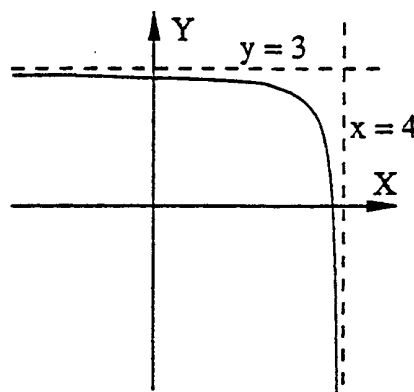
- a) $y = -f(x)$ b) $y = f(x) + 3$
 c) $y = 3 - f(x)$ d) $y = -3 - f(x)$



11. The graph of a function with equation $y = f(x)$ is shown in the diagram.

On separate diagrams, show the graphs of

- a) $y = -f(x)$ b) $y = f(x) - 3$
 c) $y = 3 - f(x)$ d) $y = -3 - f(x)$



12. The function with graph shown in the diagram has equation

$$y = \frac{1}{2}(x-2)^2 + 1$$

Make diagrams to show the image of this graph under

- a) reflection in the x axis
 b) reflection in the y axis

In each case, give the equation of the graph.

