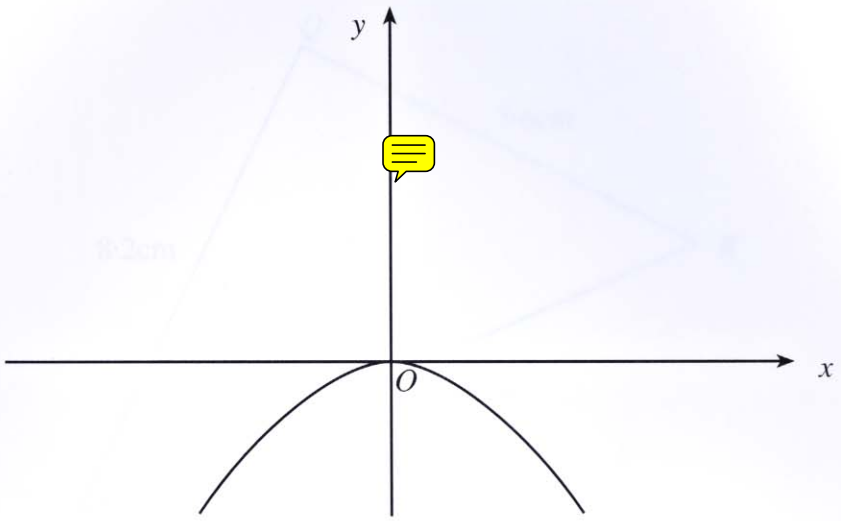
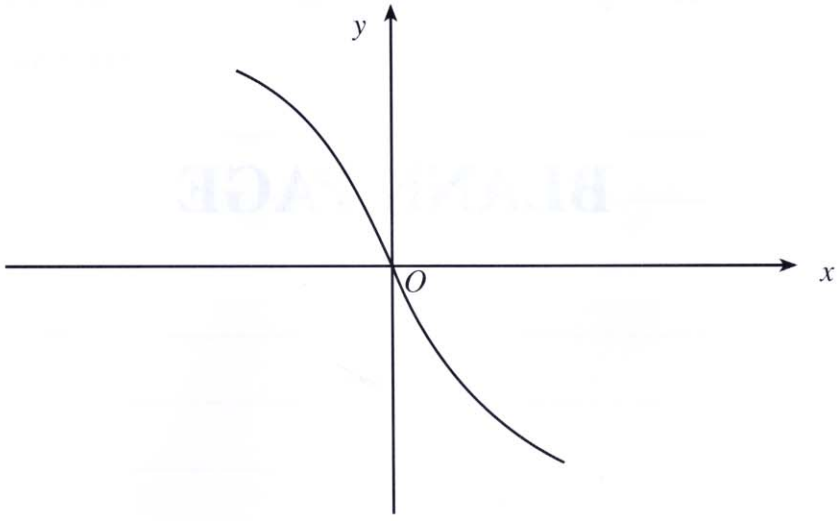
21. *(a)* The diagram shows a sketch of $y = f(x)$.
On the same diagram, sketch the curve $y = f(x) + 4$.
Mark clearly the coordinates of the point where the curve crosses the y-axis.



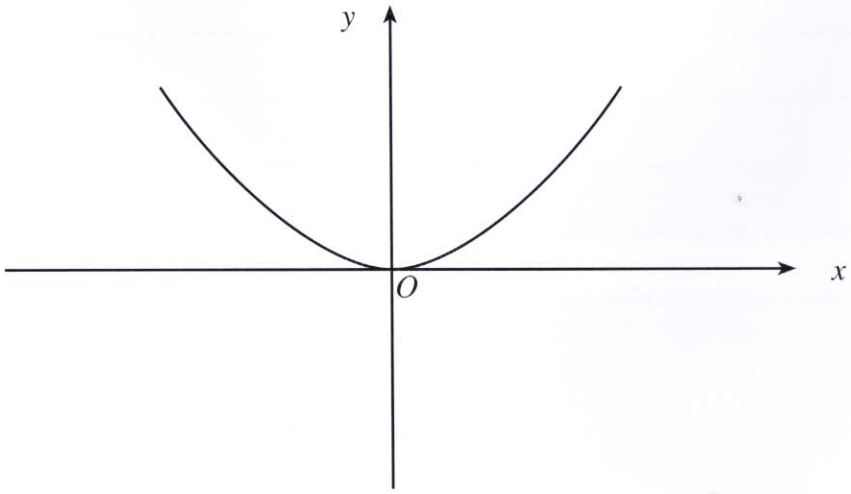
[2]

(b) The diagram shows a sketch of $y = g(x)$.
On the same diagram, sketch the curve $y = -g(x)$.



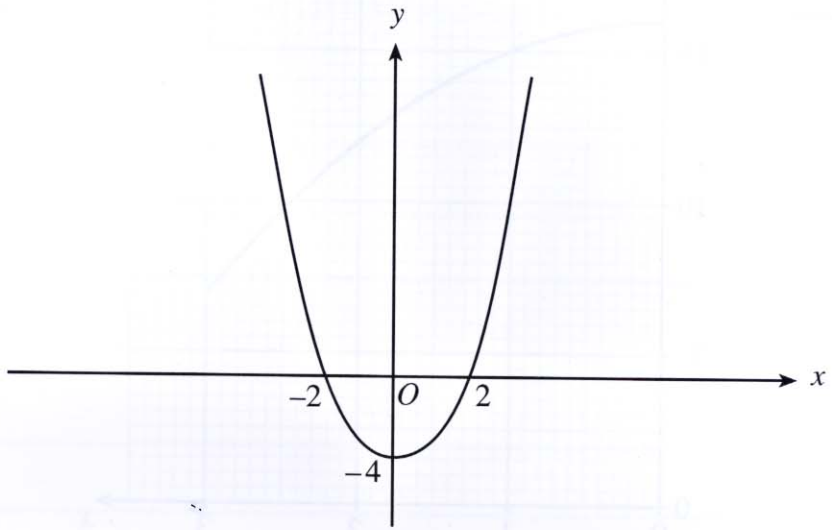
[1]

(c) The diagram shows a sketch of $y = h(x)$.
On the same diagram, sketch the curve $y = h(4x)$.



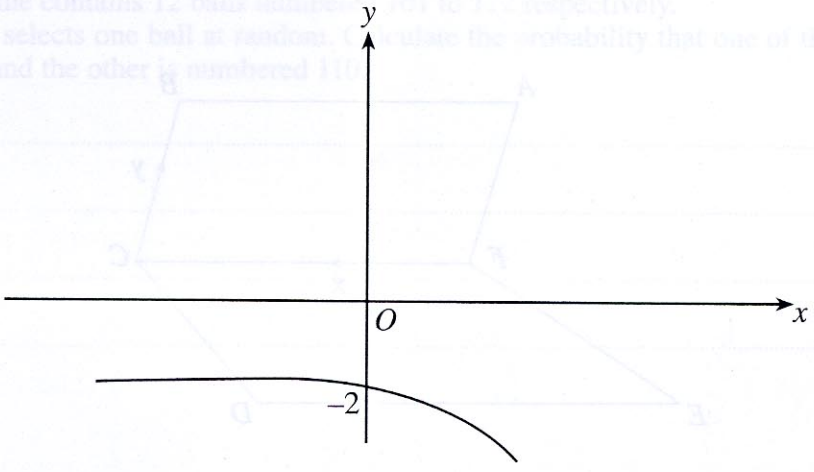
[1]

(d) The diagram shows a sketch of $y = j(x)$.
On the same diagram, sketch the curve $y = j(x - 2)$.
Mark clearly the coordinates of the point where the curve crosses the x–axis.



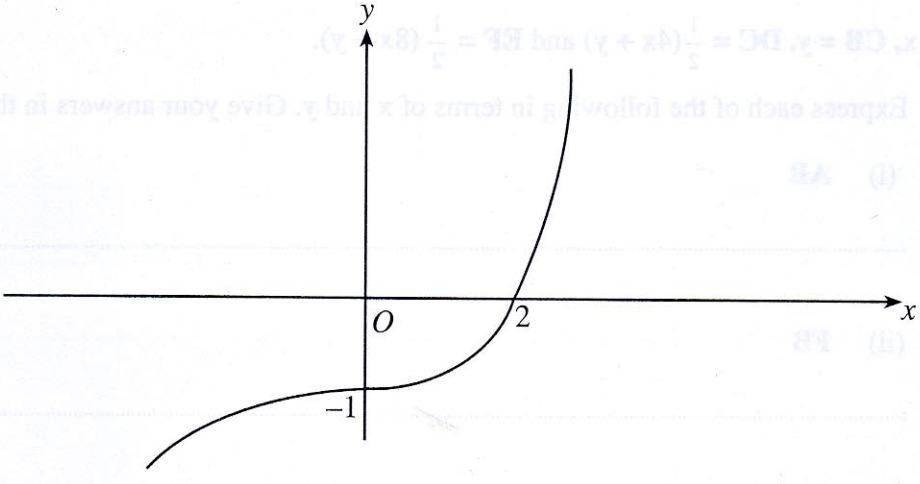
[2]

21. The diagram shows a sketch of $y = f(x)$.
On the same diagram, sketch the curve $y = f(x) + 3$.
Mark clearly the coordinates of the point where the curve crosses the y-axis.



[2]

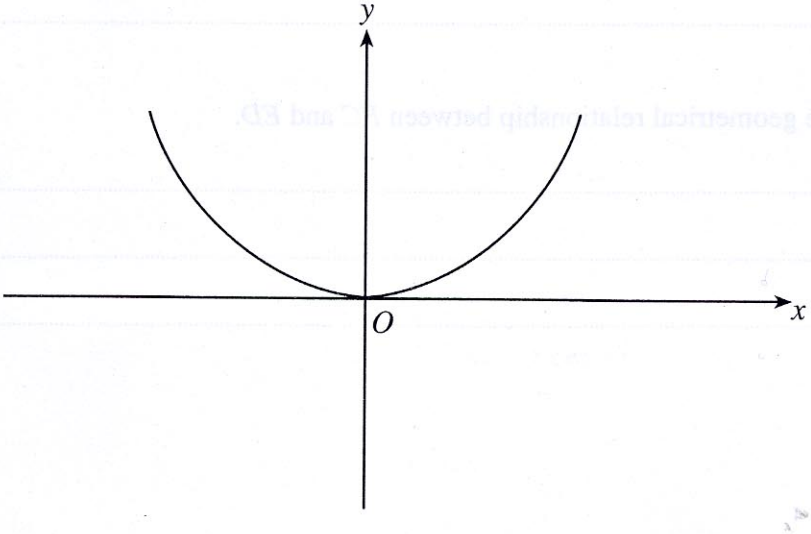
(b) The diagram shows a sketch of $y = g(x)$.
On the same diagram, sketch the curve $y = g(x - 3)$.
Mark clearly the coordinates of the point where the curve crosses the x–axis.



[2]

(c) The diagram shows the sketch of $y = x^2$.
On the same diagram, sketch the curves.

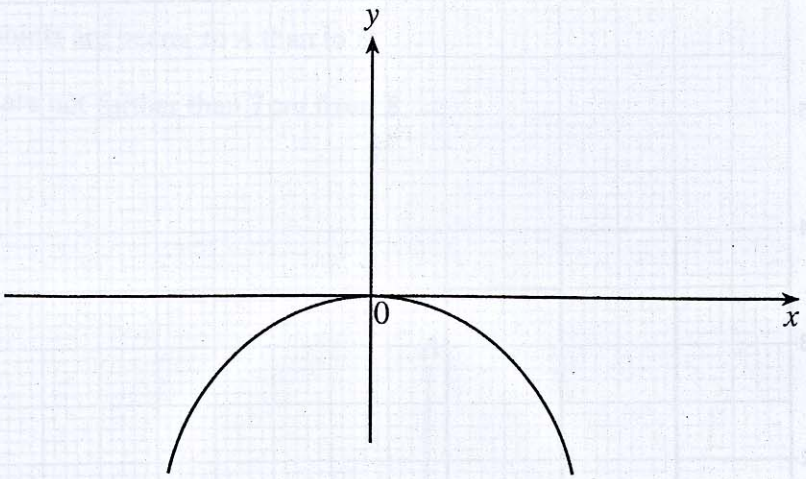
(i) $y = 4x^2$,
(ii) $y = -x^2$.



[2]

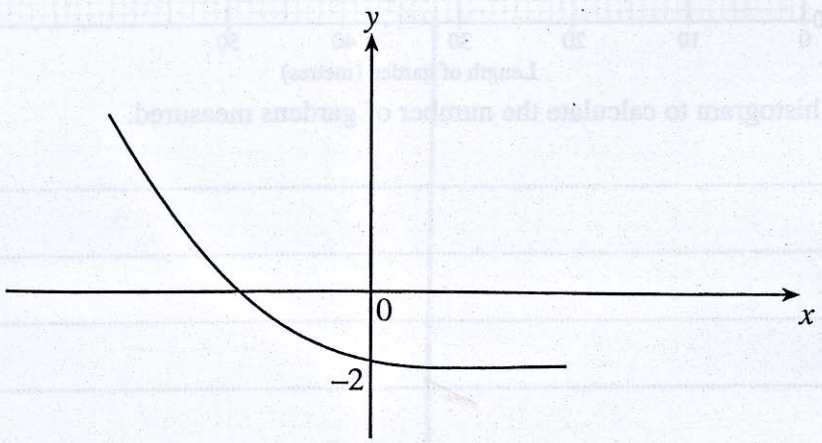
Turn over.

19. *(a)* The diagram shows a sketch of $y = f(x)$.
On the same diagram, sketch the curve $y = f(x + 6)$.
Mark clearly the coordinates of the point where the curve touches the x-axis.



[2]

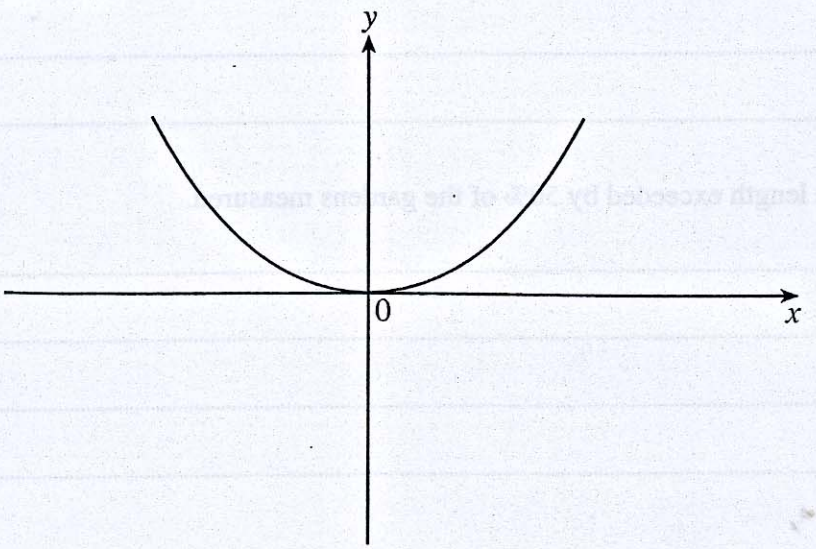
(b) The diagram shows a sketch of $y = g(x)$.
On the same diagram, sketch the curve $y = g(x) + 6$.
Mark clearly the coordinates of the point where the curve crosses the y-axis.



[2]

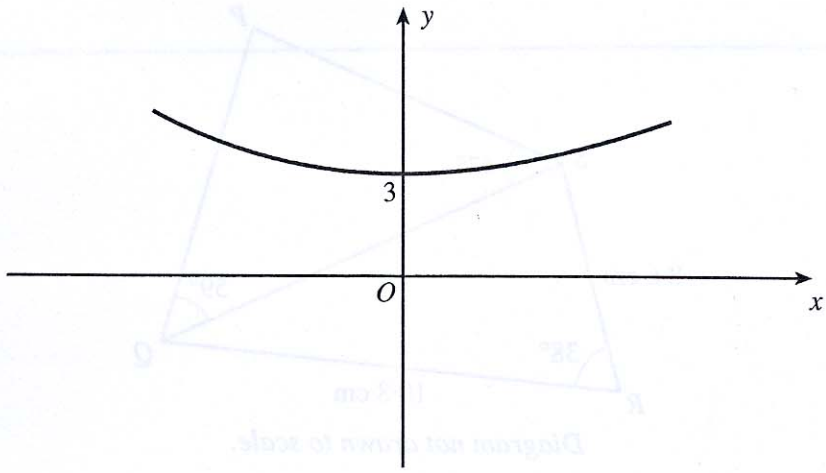
(c) The diagram shows the sketch of $y = x^2$.
On the same diagram, sketch the curves

(i) $y = -2x^2$,
(ii) $y = 3 - 2x^2$.



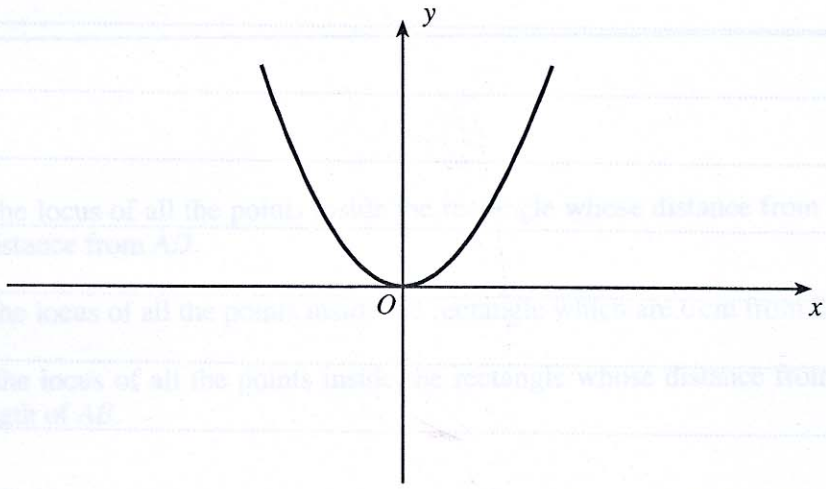
[3]

18. *(a)* The diagram shows a sketch of $y = f(x)$.
On the same diagram, sketch the curve $y = f(x) - 4$.
Mark clearly the coordinates of the point where the curve crosses the y-axis.



[2]

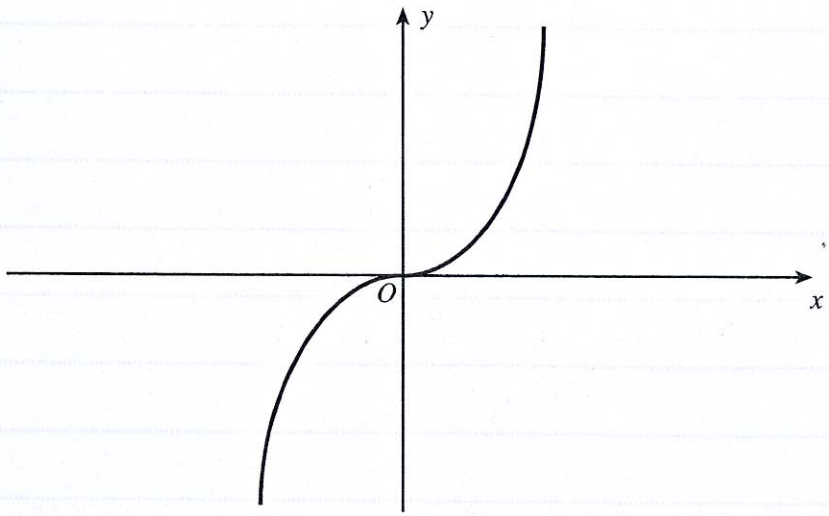
(b) The diagram shows a sketch of $y = g(x)$.
On the same diagram, sketch the curve $y = g(x + 4)$.
Mark clearly the coordinates of the points where the curve touches the x-axis.



[2]

(c) The diagram shows a sketch of $y = x^3$.
On the same diagram, sketch the curves

(i) $y = -x^3$,
(ii) $y = 3 - x^3$.



[2]