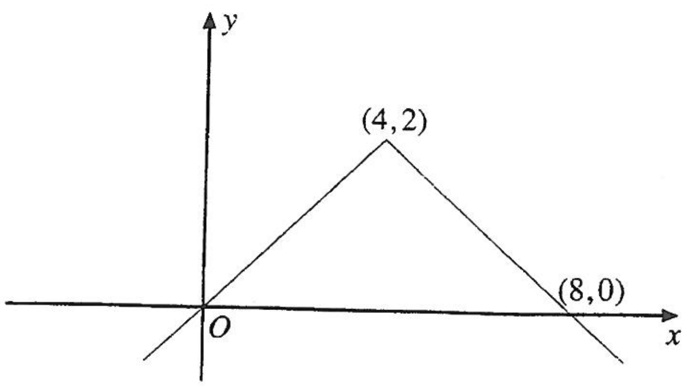
C3 Transformations (further) (1)

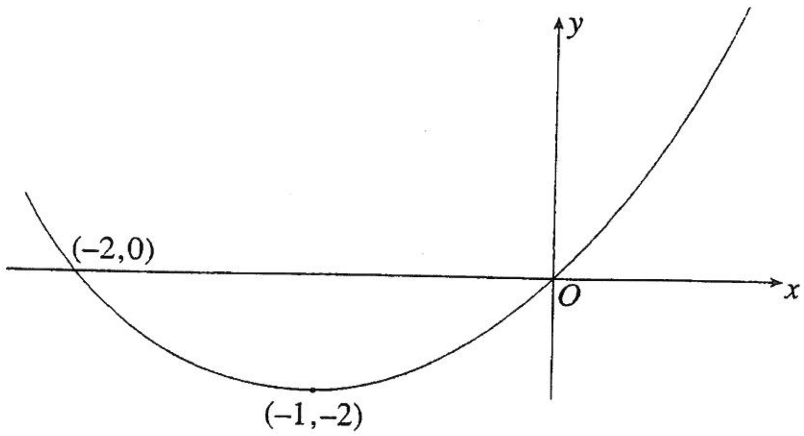
(1) 8. The diagram shows the graph of $y = f(x)$. The graph has its highest point at $(4, 2)$ and it intersects the x-axis at the points $(0, 0)$ and $(8, 0)$.



(a) Sketch the graph of $y = 2f(x + 3)$, indicating the coordinates of the highest point and of the points where the graph intersects the x-axis. [3]

(b) On a separate diagram, sketch the graph of $y = f(2x) + 1$, indicating the coordinates of the highest point and of the point where the graph intersects the y-axis. [3]

(2) 8. The diagram below shows a sketch of the graph of $y = f(x)$. The graph passes through the origin and the point $(-2, 0)$, and has a minimum point at $(-1, -2)$.



(a) Sketch the graph of $y = 2f(x - 3)$. Indicate the coordinates of the stationary point and of the points where the graph crosses the x-axis. [3]

(b) On a separate diagram, sketch the graph of $y = -f(x) + 1$. Indicate the coordinates of the stationary point and the coordinates of the point where the graph crosses the y-axis. [3]

(3) 8. Given $f(x) = \ln x$, sketch on the same diagram the graphs of $y = f(x)$ and $y = 4f(x - 1)$. Label the coordinates of the point of intersection of each of the graphs with the x-axis. Indicate the behaviour of each of the graphs for large positive and negative values of y. [5]

(4) 9. Given that $f(x) = e^x$, sketch the graphs of $y = f(x)$ and $y = 2f(x) - 1$ on the same diagram. Label the coordinates of the points of intersection with the y-axis and indicate the behaviour of the graphs for large positive and negative values of x. [5]

C3 Transformations (further) (2)

9. Given that $f(x) = e^x$, sketch, on the same diagram, the graphs of $y = f(x)$ and $y = 2f(x) + 3$. Label any points of intersection of the graphs with the y-axis. Indicate the behaviour of the graphs for large positive and negative values of x. [5]