

- 93 Figure 1 shows a sketch of the graph of  $y = f(x)$ . The graph has a minimum point at  $(-3, -4)$  and intersects the  $x$ -axis at the points  $(-8, 0)$  and  $(2, 0)$ .

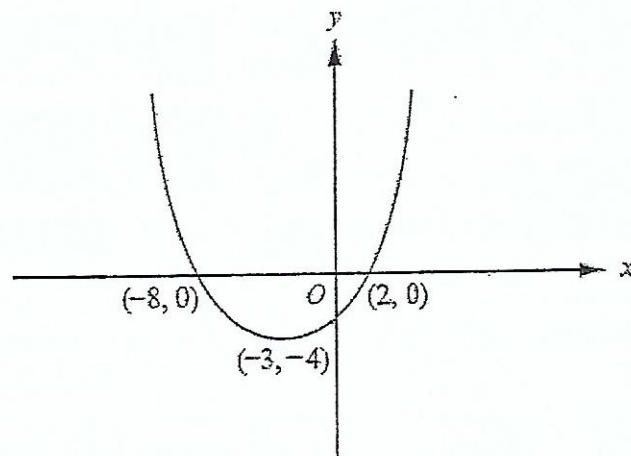


Figure 1

- (a) Sketch the graph of  $y = f(x + 3)$ , indicating the coordinates of the stationary point and the coordinates of the points of intersection of the graph with the  $x$ -axis. [3]
- (b) Figure 2 shows a sketch of the graph having one of the following equations with an appropriate value of either  $p$ ,  $q$  or  $r$ .

$$\begin{aligned} y &= f(px), \text{ where } p \text{ is a constant} \\ y &= f(x) + q, \text{ where } q \text{ is a constant} \\ y &= rf(x), \text{ where } r \text{ is a constant.} \end{aligned}$$

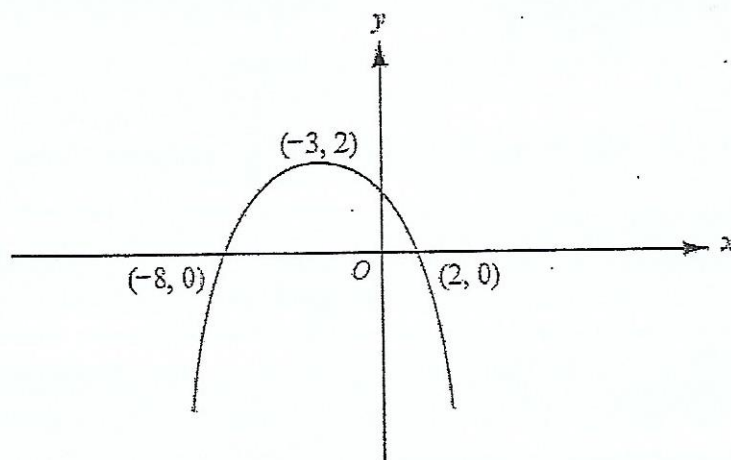


Figure 2

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