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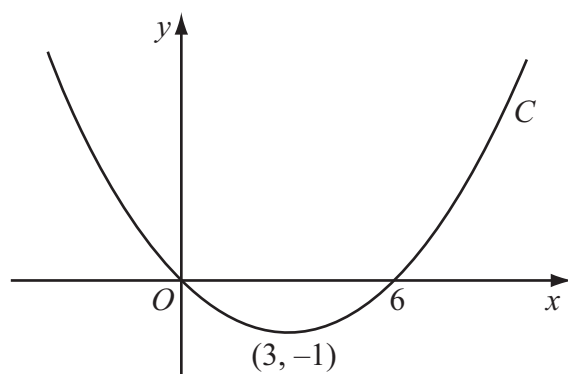








8.



**Figure 1**

Figure 1 shows a sketch of the curve  $C$  with equation  $y = f(x)$ .  
 The curve  $C$  passes through the origin and through  $(6, 0)$ .  
 The curve  $C$  has a minimum at the point  $(3, -1)$ .

On separate diagrams, sketch the curve with equation

(a)  $y = f(2x)$ , **(3)**

(b)  $y = -f(x)$ , **(3)**

(c)  $y = f(x + p)$ , where  $p$  is a constant and  $0 < p < 3$ . **(4)**

On each diagram show the coordinates of any points where the curve intersects the  $x$ -axis and of any minimum or maximum points.





**Question 8 continued**



**Question 8 continued**



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**Question 8 continued**

**Q8**

**(Total 10 marks)**











10. The curve  $C$  has equation

$$y = (x+1)(x+3)^2$$

(a) Sketch  $C$ , showing the coordinates of the points at which  $C$  meets the axes. (4)

(b) Show that  $\frac{dy}{dx} = 3x^2 + 14x + 15$ . (3)

The point  $A$ , with  $x$ -coordinate  $-5$ , lies on  $C$ .

(c) Find the equation of the tangent to  $C$  at  $A$ , giving your answer in the form  $y = mx + c$ , where  $m$  and  $c$  are constants. (4)

Another point  $B$  also lies on  $C$ . The tangents to  $C$  at  $A$  and  $B$  are parallel.

(d) Find the  $x$ -coordinate of  $B$ . (3)











