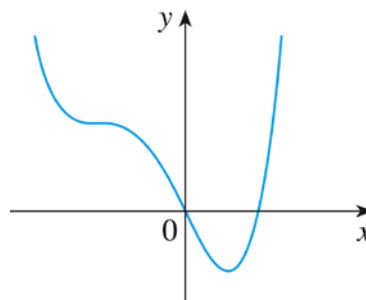
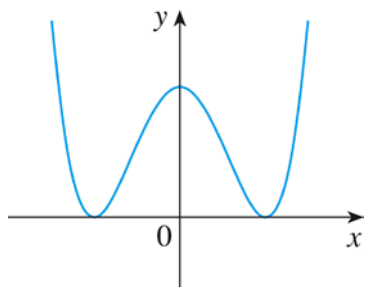


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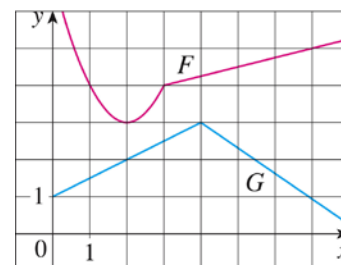
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1. The graph of the function  $f$  is given, use it to sketch the graph of its derivative  $f'$ . (10)



2. Let  $P(x) = F(x)G(x)$ , and  $Q(x) = \frac{F(x)}{G(x)}$ , where F and G are the functions whose graphs are shown.

Find  $P'(2)$  and  $Q'(7)$  (10)



3. Find the first derivative of each function (60)

(1)  $y = (3x^2 - 1)^4 \cdot 10^{2x} + \sin(10)$

(2)  $y = \tan^{-1} \sqrt{2 - x^5}$

(3)  $y = (\log x)^x$

4. Find the tangent lines to the curve  $\sin(xy) + y^3 = x + 2y - 1$  at the point  $(0, 1)$  (20)