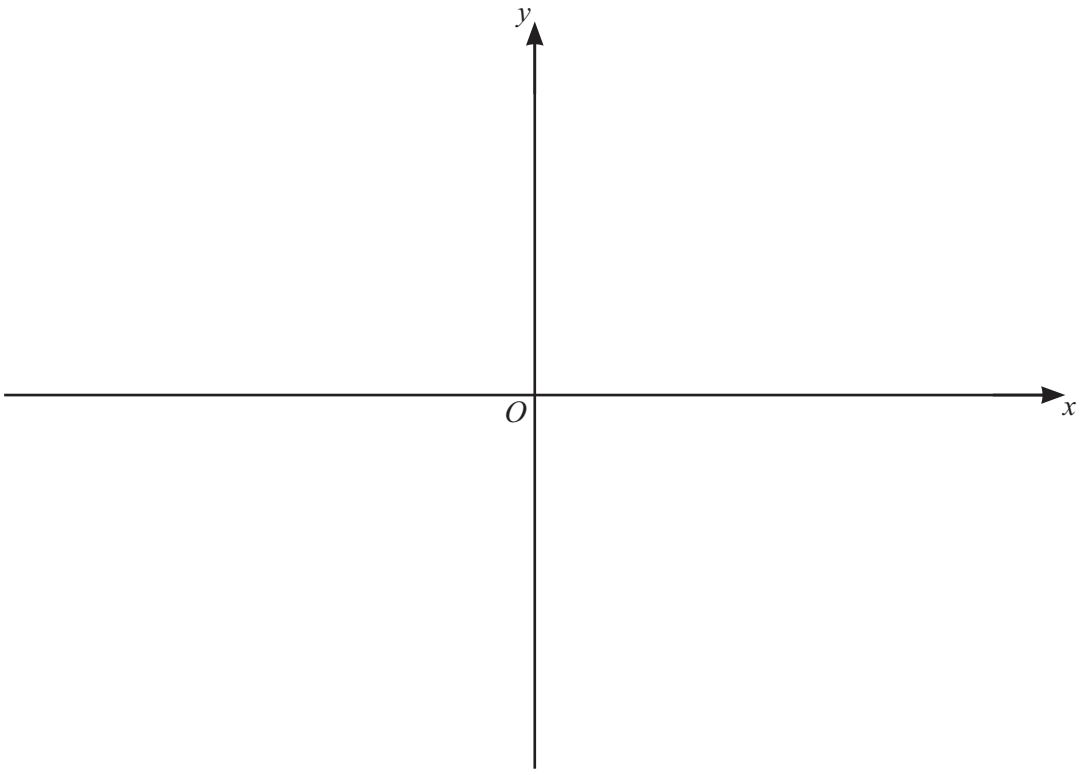
2 It is given that $y = \mathrm{f}(x)$, where $\mathrm{f}(x) = (2x-5)(x-1)^2$.

(a) Find the coordinates of the stationary points on the curve $y = \mathrm{f}(x)$. [4]

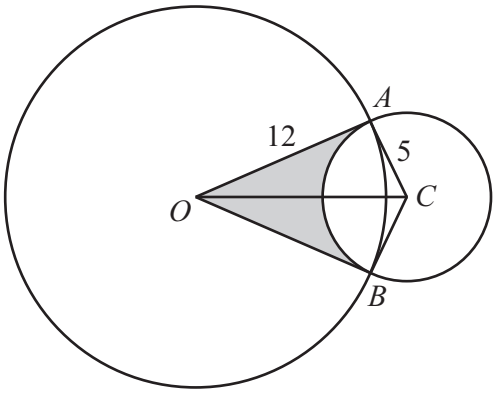
(b) On the axes, sketch the graph of $y = \mathrm{f}(x)$, stating the intercepts with the axes. [3]



(c) Hence find the values of k for which $\mathrm{f}(x) = k$ has exactly one solution. [2]

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3 In this question, all lengths are in centimetres and all angles are in radians.



The diagram shows a circle with centre O and radius 12, and a circle with centre C and radius 5.
The circles intersect at the points A and B, such that OA and OB are tangents to the circle with centre C.

(a) Show that the obtuse angle ACB is 2.35 radians, correct to 2 decimal places. [2]

(b) Find the perimeter of the shaded region. [2]

(c) Find the area of the shaded region. [3]

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