**4.** The function f is defined by

$$f(x) = 2x^2 - 5 \qquad x \geqslant 0 \quad x \in \mathbb{R}$$

(a) State the range of f

**(1)**

On the following page there is a diagram, labelled Diagram 1, which shows a sketch of the curve with equation $y = f(x)$.

(b) On Diagram 1, sketch the curve with equation $y = f^{-1}(x)$.

**(2)**

The curve with equation $y = f(x)$ meets the curve with equation $y = f^{-1}(x)$ at the point $P$

Using algebra and showing your working,

(c) find the exact $x$ coordinate of $P$

**(3)**

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**Question 4 continued**

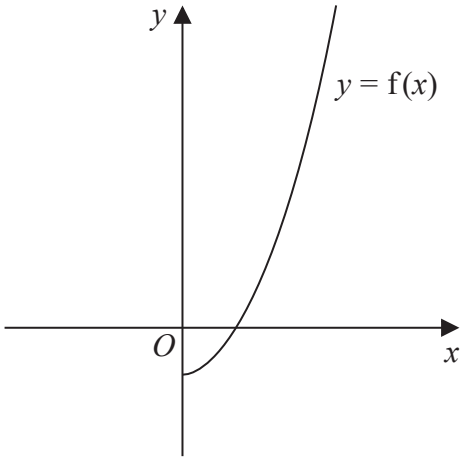



**Diagram 1**

**(Total for Question 4 is 6 marks)**

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**5.** **In this question you must show all stages of your working.**

**Solutions relying entirely on calculator technology are not acceptable.**

(i) Solve, for $0 < x < \pi$

$$(x - 2)\left(\sqrt{3}\sec x + 2\right) = 0$$

**(3)**

(ii) Solve, for $0 < \theta < 360°$

$$10\sin\theta = 3\cos 2\theta$$

**(4)**

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