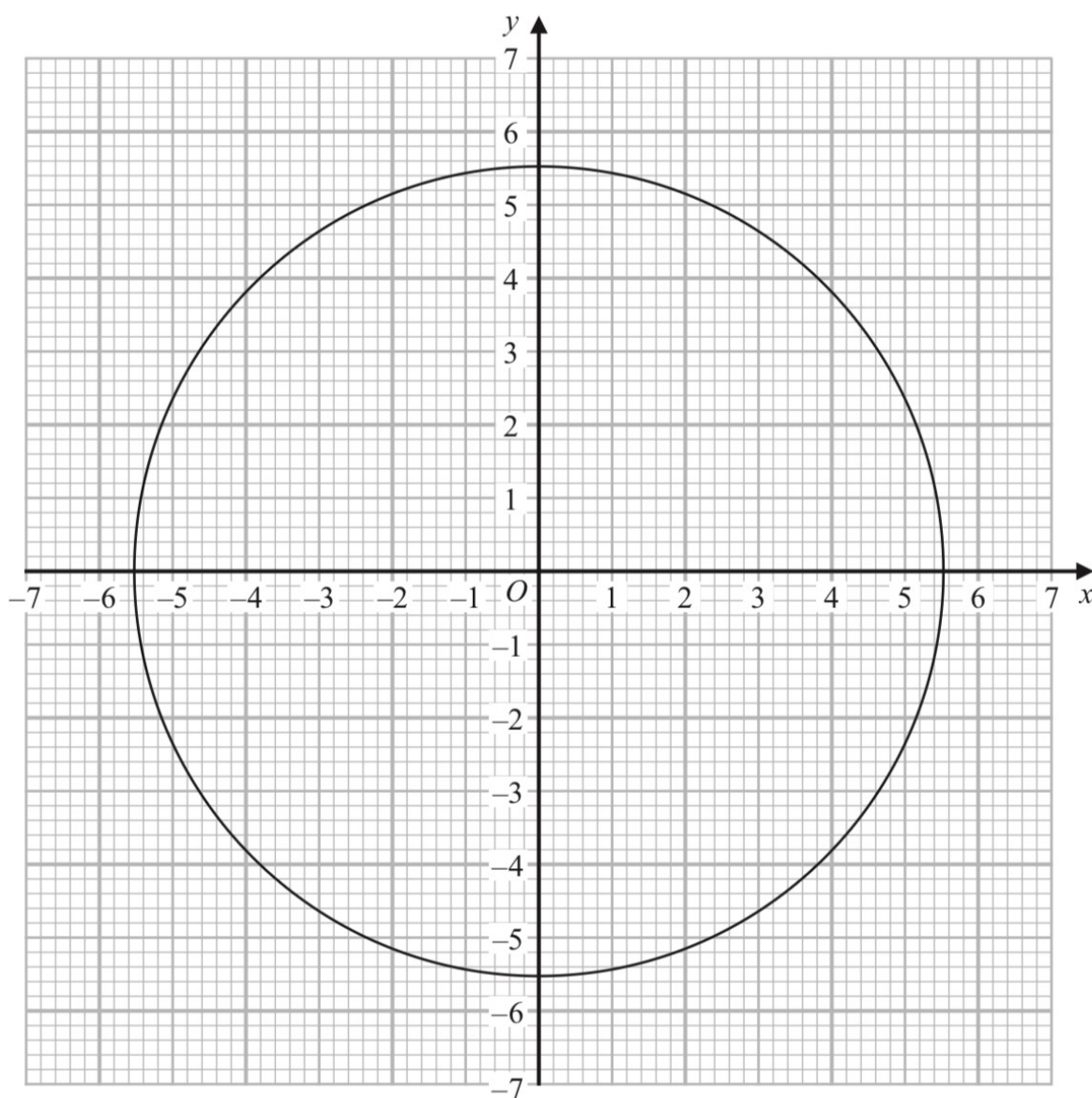


**Question 1 (3 Marks)**

The diagram shows the graph of  $x^2 + y^2 = 30.25$



Use the graph to find estimates for the solutions of the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 30.25 \\y - 2x &= 1\end{aligned}$$

**Question 2 (7 Marks)**

The functions  $f$  and  $g$  are such that

$$f(x) = 3x - 1 \quad \text{and} \quad g(x) = x^2 + 4$$

(a) Find  $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots (2)$$

Given that  $fg(x) = 2gf(x)$ ,

(b) show that  $15x^2 - 12x - 1 = 0$

**Question 3 (5 Marks)**

The point  $P$  has coordinates  $(3, 4)$

The point  $Q$  has coordinates  $(a, b)$

A line perpendicular to  $PQ$  is given by the equation  $3x + 2y = 7$

Find an expression for  $b$  in terms of  $a$ .