**4.**

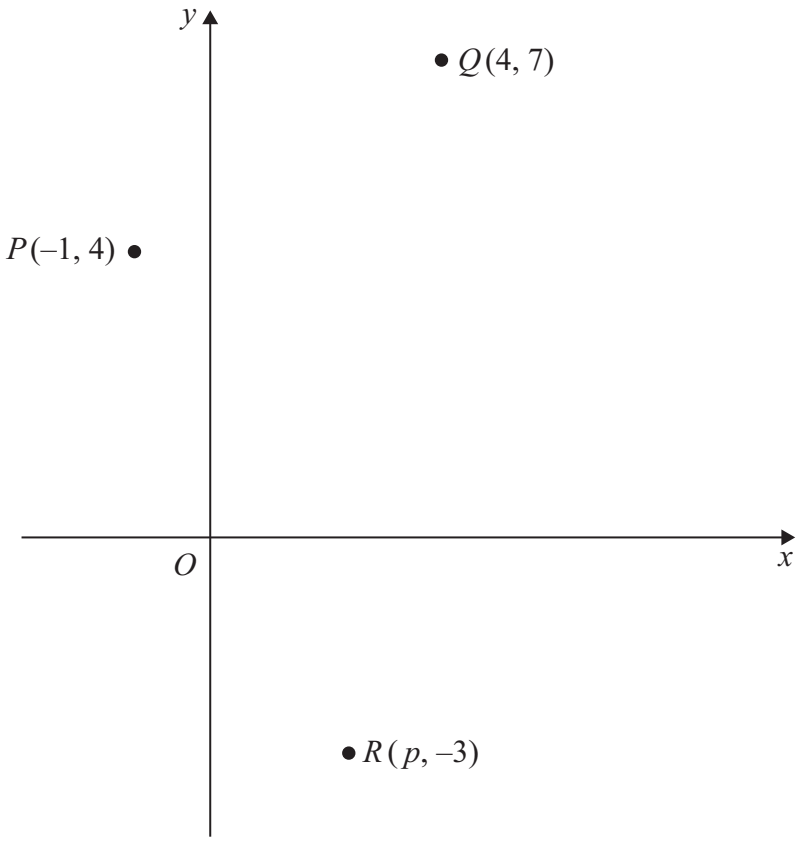



**Figure 2**

Figure 2 shows the points $P$, $Q$ and $R$.

Points $P$ and $Q$ have coordinates $(-1, 4)$ and $(4, 7)$ respectively.

(a) Find an equation for the straight line passing through points $P$ and $Q$.

Give your answer in the form $ax + by + c = 0$ where $a$, $b$ and $c$ are integers.

**(3)**

The point $R$ has coordinates $(p, -3)$, where $p$ is a positive constant.

Given that angle $QPR = 90°$,

(b) find the value of $p$.

(*Solutions relying on calculator technology are not acceptable.*)

**(3)**

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

**5.** Find

$$\int \frac{4\sqrt{x} - 3}{2x^2} \mathrm{d}x \qquad x > 0$$

writing the answer in its simplest form.

**(5)**

**(Total for Question 5 is 5 marks)**

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**6.** **In this question you must show all stages of your working.**
**Solutions relying on calculator technology are not acceptable.**

The equation

$$k(3x^2 + 8x + 9) = 2 - 6x$$

where $k$ is a real constant, has no real roots.

Find the range of possible values for $k$.

**(7)**

**(Total for Question 6 is 7 marks)**