

15.

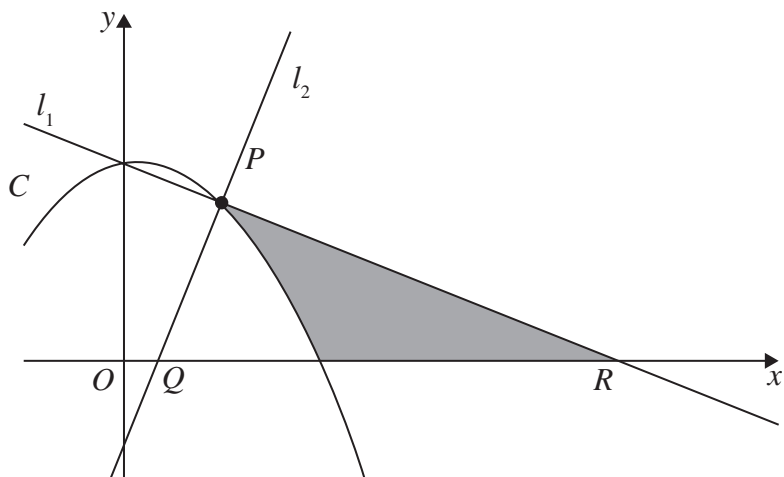


Figure 2

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

Figure 2 shows a sketch of part of the curve C with equation

$$y = -\frac{3}{50}x^2 + \frac{1}{5}x + 20$$

and a sketch of the line l_1 with equation

$$5y + 2x = 100$$

(a) State the gradient of l_1 (1)

The point $P(10, 16)$ lies on C .

The line l_2 is perpendicular to l_1 and intersects l_1 at P as shown in Figure 2.

(b) Find an equation for l_2 , giving your answer in the form $ax + by + c = 0$ where a , b and c are constants. (3)

Given that l_2 crosses the x -axis at the point Q

(c) find the x coordinate of Q (2)

Given also that l_1 crosses the x -axis at the point R

(d) find the exact area of triangle PQR (3)

The shaded region, shown in Figure 2, is bounded by C , the x -axis and l_1

(e) Find, in simplest form, the fraction of triangle PQR that is shaded. (6)