8.

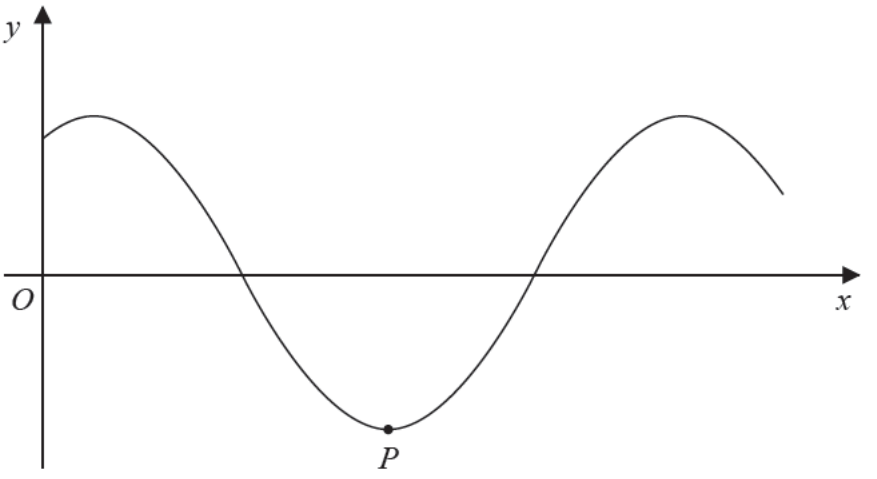

Figure 2

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

$$y = 5\cos(x - 30)^\circ \qquad x \geqslant 0$$

The point P on the curve is the minimum point with the smallest positive x coordinate.

(a) State the coordinates of P.

(2)

(b) Solve, for $0 \leqslant x < 360$, the equation

$$5\cos(x - 30)^\circ = 4\sin x^\circ$$

giving your answers to one decimal place.

(4)

(c) Deduce, giving reasons for your answer, the **number of roots** of the equation

$$5\cos(2x - 30)^\circ = 4\sin 2x^\circ \text{ for } 0 \leqslant x < 3600$$

(2)