



**Figure 2**

Figure 2 shows a circle of radius 12 cm which passes through the points  $P$  and  $Q$ . The chord  $PQ$  subtends an angle of  $120^\circ$  at the centre of the circle.

- (a) Find the exact length of the major arc  $PQ$ . (2)
- (b) Show that the perimeter of the shaded minor segment is given by  $k(2\pi + 3\sqrt{3})$  cm, where  $k$  is an integer to be found. (4)
- (c) Find, to 1 decimal place, the area of the shaded minor segment as a percentage of the area of the circle. (4)