(55 marks)

Question 9

R is a radar station located 120 km north of a port P. The circle *c*, centred at *R* and with radius 100 km shows the detection range of the radar. When a ship enters the circle it will be detected by the radar station at *R*.

Figure 1 shows a ship leaving port *P* and sailing in the direction north 30° east.

The ship enters the circle *c* at *S* and exits at *T*. At Q, the ship is closest to R and $|\angle PQR| = 90^{\circ}$.



The triangle *QRS* taken from **Figure 1** is shown in **Figure 3**. (b) Use your answer from **part (a)** to find |*QS*|.





Q

(a) The triangle *PQR* taken from **Figure 1** is shown in **Figure 2**. Find |QR|, the length of [QR].

