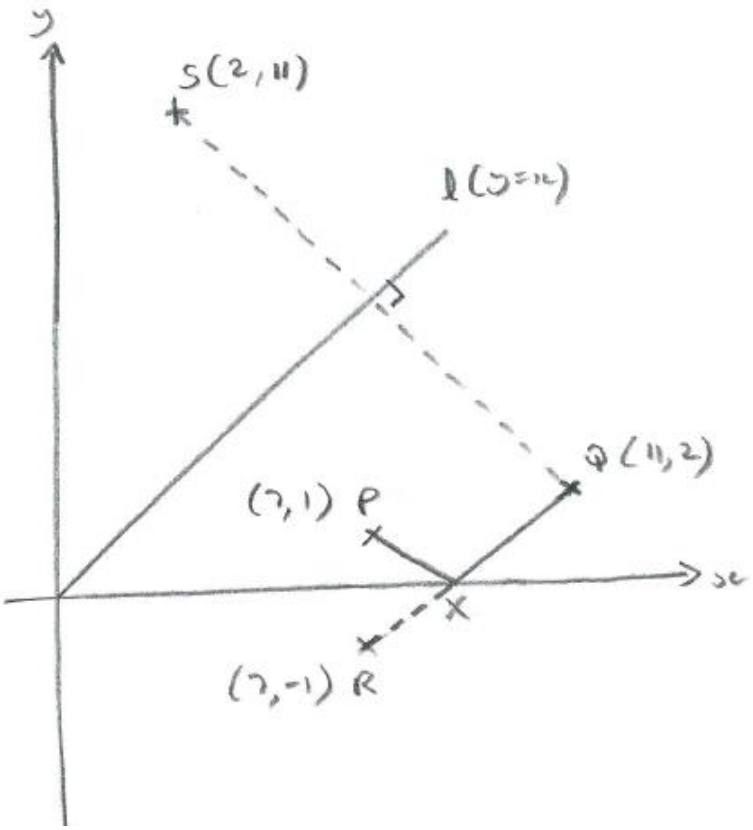
MAT: Specimen 2 - Q4 (2 Pages; 21/10/20)

(i)



(ii) Referring to the diagram in (i), as $PX = RX$,

$PX + XQ = RX + XQ$, and this is minimised when X lies on the line RQ.

In that case, $RX + XQ = RQ = \sqrt{(11-7)^2 + (2-[-1])^2}$

$= \sqrt{16+9} = 5$

(iii) See the diagram in (i).

(iv) Referring to the diagram below, $ZQ = ZS$, and so

$PY + YZ + ZQ = PY + YZ + ZS$

Also, as before, $PY = RY$,

so that $PY + YZ + ZS = RY + YZ + ZS$,

and this minimised when Y and Z lie on the line RS.

In that case, $PY + YZ + ZQ = RS = \sqrt{(2-7)^2 + (11-[-1])^2}$

$= \sqrt{25 + 144} = 13$