

Three points P, Q and R have the position vectors p, q and r respectively where $p=7i+10j$, $q=3i+12j$
 $r=-i+4j$
Show that $|QS| = |RS|$ by finding the PSQ where S is the mid-point of PR

Solution

Find coordinates of point S:

$$S\left(\frac{7-1}{2}; \frac{10+4}{2}\right) = S(3; 7).$$

Find coordinates of \overline{QS} and \overline{RS} :

$$\overline{QS} = (3 - 3; 7 - 12) = (0; 5).$$

$$\overline{RS} = (3 - (-1); 7 - 4) = (4; 3).$$

Find length of \overline{QS} and \overline{RS} :

$$|\overline{QS}| = \sqrt{0^2 + 5^2} = \sqrt{25} = 5.$$

$$|\overline{RS}| = \sqrt{4^2 + 3^2} = \sqrt{25} = 5.$$

Answer: so $|\overline{QS}| = |\overline{RS}|$.

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