

Geo

Unit 3/Ch 4

Sec 4.5

Coordinate Proofs

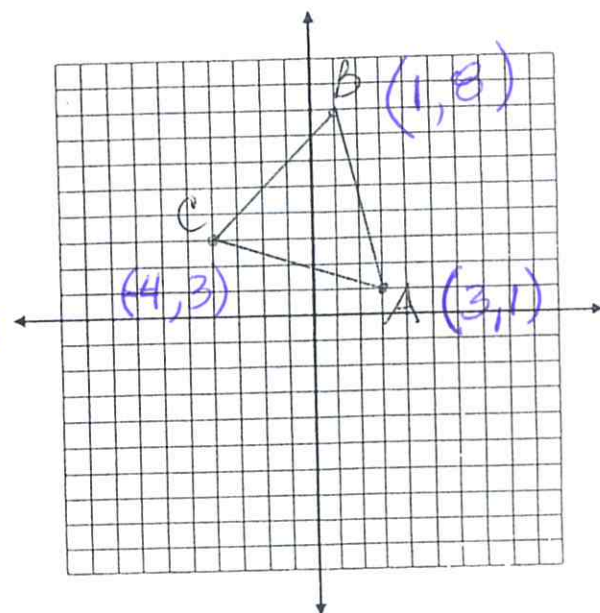
1. Prove that $\triangle ABC$ is an isosceles $\triangle$.

Show $AC = AB$ since both $= \sqrt{53}$

$$AC = \sqrt{(3-4)^2 + (3-1)^2} = \sqrt{1^2 + 2^2} = \sqrt{1+4} = \sqrt{5}$$

$$AB = \sqrt{(3-1)^2 + (8-1)^2} = \sqrt{2^2 + 7^2} = \sqrt{4+49} = \sqrt{53}$$

$\therefore \triangle ABC$ is isosceles



2. Prove the $\triangle PQR$ is an isosceles right $\triangle$ if $P(-7, -6)$ $Q(-7, 0)$ $R(-1, -6)$

Show $PQ = PR$ since both $= 6$

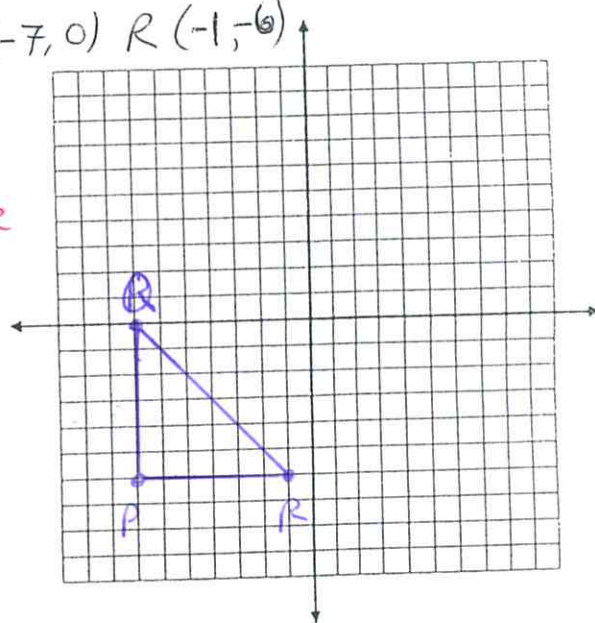
$\overline{PQ} \perp \overline{PR}$ since slopes are opposite reciprocals

$$PQ = \sqrt{(-7-7)^2 + (0-6)^2} = \sqrt{0^2 + 6^2} = \sqrt{36} = 6$$

$$PR = \sqrt{(-1-7)^2 + (-6-6)^2} = \sqrt{6^2 + 6^2} = \sqrt{36+36} = \sqrt{72} = 6\sqrt{2}$$

$$m_{\overline{PQ}} = \frac{0-6}{-7-7} = \frac{6}{-14} = -\frac{3}{7}$$

$$m_{\overline{PR}} = \frac{-6-6}{-1-7} = \frac{-12}{-8} = \frac{3}{2}$$



$\therefore \triangle PQR$ is an isosceles right $\triangle$