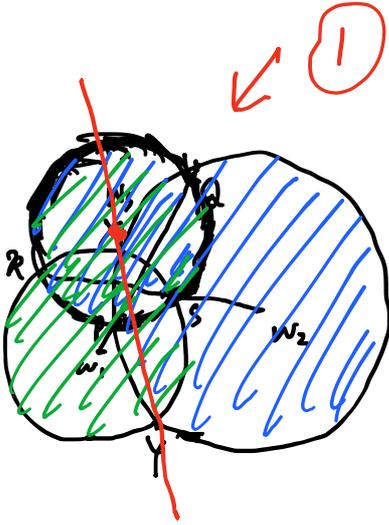


Given circles  $\omega_1$  and  $\omega_2$  intersecting at points  $X$  and  $Y$ , let  $\ell_1$  be a line through the center of  $\omega_1$  intersecting  $\omega_2$  at points  $P$  and  $Q$  and let  $\ell_2$  be a line through the center of  $\omega_2$  intersecting  $\omega_1$  at points  $R$  and  $S$ . Prove that if  $P, Q, R$  and  $S$  lie on a circle then the center of this circle lies on line  $XY$ .



$$W_2, W_3 \quad PQ$$

$$W_1 W_3^2 - r_3^2 = W_1 W_2^2 - r_2^2$$

$$W_1, W_3 \quad RS$$

$$W_2 W_3^2 - r_3^2 = W_1 W_2^2 - r_1^2$$

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$$W_1 W_3^2 - W_2 W_3^2 = -r_2^2 + r_1^2$$

$$W_1 W_3^2 - r_1^2 = W_2 W_3^2 - r_2^2$$

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$$\text{Pow}_{\omega_1}(W_3)$$

$$\text{Pow}_{\omega_2}(W_3)$$

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