# ROMANIAN MATHEMATICAL MAGAZINE

**If $\lambda > 0$ fixed then solve for reals:**

$$(x-2y)^2+5\lambda^2=6x(\lambda-2x)+6y(2\lambda-y)$$

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$$(x-2y)^2+5\lambda^2=6x(\lambda-2x)+6y(2\lambda-y)$$

$$\textit{Expanding we get:}$$
$$13x^2-(4y+6\lambda)x+(10y^2-12\lambda y+5\lambda^2)=0$$

$$or\ x=\frac{4y+6\lambda\pm\sqrt{(4y+6\lambda)^2-52(10y^2-12\lambda y+5\lambda^2)}}{26}\ (1)$$
$$The\ discriminant\ D=(4y+6\lambda)^2-52(10y^2-12\lambda y+5\lambda^2)=$$
$$=-504y^2+672\lambda y-224\lambda^2=-56(3y-2\lambda)^2\ clearly\ D<0\,.$$

$$So\ real\ solution\ exist\ for\ fixed\ \lambda\ only\ when\ (3y-2\lambda)^2=0\ or\ y=\frac{2\lambda}{3}$$
$$From\ (1):\ x=\frac{\frac{4.2\lambda}{3}+6\lambda}{26}=\frac{\lambda}{3}$$

$$So\ required\ solution\ x=\frac{\lambda}{3},y=\frac{2\lambda}{3}\,.$$