# The Radial Kernel (RBF)

The **Radial Kernel**

$$K(a,b) = e^{-\gamma}(a-b)^2$$

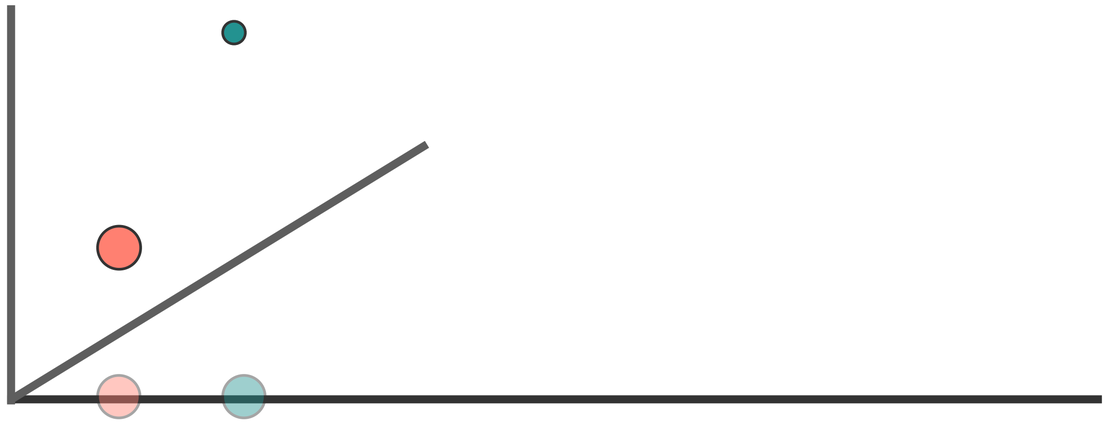
projects to **infinite dimensional** space

works similar to nearest neighbors classifier

we can use the Polynomial Kernel to get the intuition
behind how Radial Kernel works in infinite dimensions

$$K(a,b) = (a \cdot b)^d$$

$$ab + a^2b^2 + a^3b^3 = (a, a^2, a^3)(b, b^2, b^3)$$



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$$K(a,b) = (a \cdot b)^d$$

$$ab + a^2b^2 + a^3b^3 + \cdots + a^\infty b^\infty = (a, a^2, a^3, \ldots, a^\infty)(b, b^2, b^3, \ldots, b^\infty)$$

take sum for infinite terms gives dot product with infinite dimensions!