

Conversely, given any center  $(a, b)$  & radius  $r$ , choose  $(37)$

$$c = \frac{1}{2} (a^2 + b^2 - r^2 - 1)$$

$$d = \frac{1}{2} (a^2 + b^2 - r^2 + 1)$$

$$\rightarrow \boxed{a^2 + b^2 + c^2 = d.}$$