

(5)

-1-

Definition:- Let (X, d) be the metric space and r is any positive number, then the closed ball $B_r(p)$ (disk) centered at a point p is the set of all points $x \in X$ s.t. $d(x, p) \leq r$.

كل قرص هو قرص مغلق
والقرص هو قرص مغلق.
 $B_r(p) = \{x \in X, d(x, p) \leq r\}$.

Example:- Let (\mathbb{R}, d) be the usual metric space.

Find $B_3(2)$, [$p=2, r=3$]

$$\begin{aligned} \text{Sol} = B_3(2) &= \{x \in X : d(x, p) \leq r\} \\ &= \{x \in X : d(x, 2) \leq 3\} \\ &= \{x \in X : |x-2| \leq 3\} \\ &= \{x \in X : -3 \leq x-2 \leq 3\} \\ &= \{x \in X : -1 \leq x \leq 5\} \\ &= [-1, 5] \end{aligned}$$