Ans - 3 Prove

$(A \bullet B)^c = (A^c \circ \hat{B})$ and

$(A \circ B)^c = (A^c \circ \hat{B}^{\bullet})$.

Starting with the definition of closing:

$$(A \bullet B)^c = [(A \oplus B) \ominus B]^c$$

$$= (A \oplus B)^c \oplus \hat{B}$$

$$= (A^c \ominus \hat{B}) \oplus \hat{B}$$

$$\boxed{(A \bullet B)^c = (A^c \circ \hat{B})}$$

hence proved

Starting with the definition of opening.

$$(A \circ B)^c = [(A \ominus B) \oplus B]^c$$

$$= (A \ominus B)^c - B^{\wedge}$$

$$= (A^c \oplus \hat{B}) \ominus \hat{B}$$

$$= (A^c \circ \hat{B})$$

then

$$\boxed{(A \circ B)^c = A^c \circ \hat{B}}$$

hance prove.