

$$\text{If } x \text{ is non-positive then } x \leq -\sqrt{\frac{1}{2}} \quad (6)$$

(4) and (6) tell us that

$$(4) \quad -1 \leq x \leq 0$$

$$(6) \quad \text{If } x \text{ is non-positive then } x \leq -\sqrt{\frac{1}{2}}$$

$$\text{Therefore } -1 \leq x \leq -\sqrt{\frac{1}{2}}$$