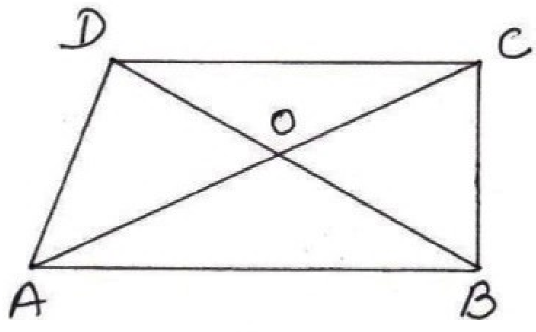
5



given - $\square ABCD$, diagonals intersect each other at O

to prove - $AB + BC + CD + DA < 2(AC + BD)$

proof - In $\triangle AOB$

$OA + OB > AB \dots (i)$ ($\because$)

In $\triangle BOC$

$OB + OC > BC \dots (ii)$ ($\because$)

In $\triangle COD$

$OC + OD > CD \dots (iii)$ ($\because$)

In $\triangle DOA$

$OD + OA > DA \dots (iv)$ ($\because$)

(i) + (ii) + (iii) + (iv)

$2(OA + OC + OB + OD) > AB + BC + CD + DA$

$\Rightarrow 2(AC + BD) > AB + BC + CD + DA$

$\Rightarrow AB + BC + CD + DA < 2(AC + BD)$

let $a = 12\,cm$, $b = 15\,cm$, let third side $= c$

$b - a < c < b + a$

$15 - 12 < c < 15 + 12$

$\Rightarrow 3 < c < 27$