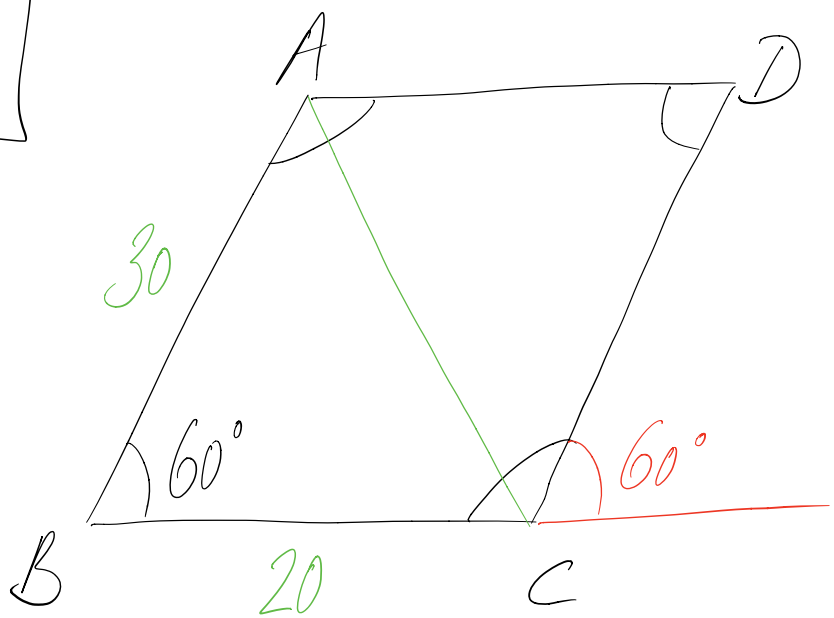
5.13



2C

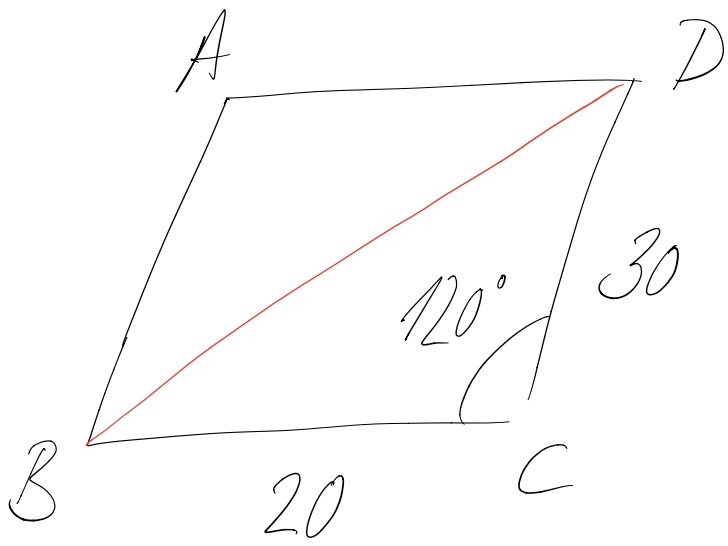
$$AC^2 = 30^2 + 20^2 - 2 \cdot 30 \cdot 20 \cdot \cos 60°$$

$$= 900 + 400 - 1200 \cdot \underbrace{\cos 60°}_{0,5}$$

$$= 1300 - 600$$

$$= 700$$

$$\Rightarrow AC = \sqrt{700} \simeq \underline{26,46}$$



$$BD^2 = 20^2 + 30^2 - 2 \cdot 20 \cdot 30 \cdot \cos 120°$$

$$= 400 + 900 - 2 \cdot 600 \cdot (-0{,}5)$$

$$= 1300 + 2 \cdot 600 \cdot 0{,}5$$

$$= 1300 + 600 = 1900$$

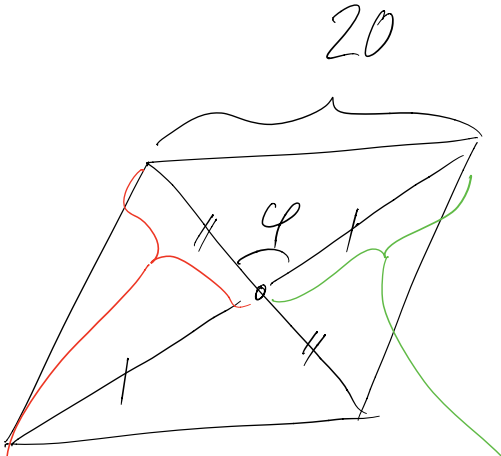
$$\Rightarrow BD = \sqrt{1900} \approx \underline{43{,}59}$$

$$\text{Aire } \triangle ABC = \frac{1}{2} \cdot 20 \cdot 30 \cdot \sin 60°$$

$$\simeq 259,81$$

$$\Rightarrow \text{Aire de } ABCD \simeq 2 \cdot 259,81$$

$$\simeq 519,61$$



Les diagonales d'un parallélogramme se coupent en leur milieu.

$\frac{26,46}{2} = 13,23$

$\frac{43,59}{2} \simeq 21,80$

$$20^2 \approx 13{,}23^2 + 21{,}80^2 - 2 \cdot 13{,}23 \cdot 21{,}8 \cdot \cos\varphi$$

$$\Leftrightarrow 400 - 175{,}03 - 475{,}24 \approx -576{,}83 \cos\varphi$$

$$\Leftrightarrow \frac{-250{,}27}{-576{,}83} \approx \cos\varphi$$

$$\Leftrightarrow \cos\varphi \approx 0{,}43387\overline{13}$$

$$\Rightarrow \underline{\varphi \approx 64{,}3^\circ}$$