



正答率 7



平行四辺形 ABCD において、 $AB=7\text{ cm}$ 、 $BC=8\text{ cm}$ で、対角線 $AC=13\text{ cm}$ である。
このとき、

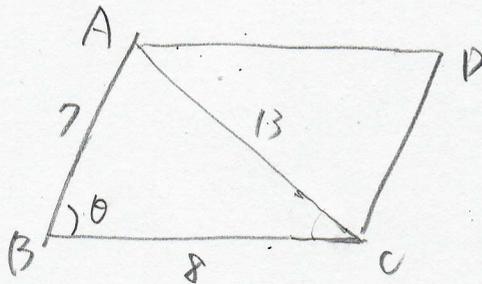
(1) $\cos \angle ABC = \frac{\boxed{\text{アイ}}}{\boxed{\text{ウ}}}$

(2) 平行四辺形 ABCD = $\boxed{\text{エオ}} \sqrt{\boxed{\text{カ}}}$ cm^2

(3) $BD = \sqrt{\boxed{\text{キク}}}$ cm

(4) $\sin \angle ACB = \frac{\boxed{\text{ケ}} \sqrt{\boxed{\text{コ}}}}{\boxed{\text{サシ}}}$

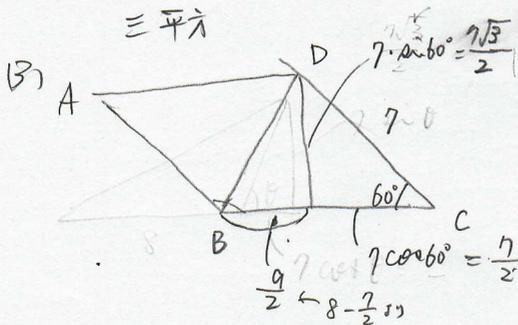
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1) $169 = 49 + 64 - 2 \cdot 7 \cdot 8 \cos \theta$
 $169 = 113 - 112 \cos \theta$
 $\cos \theta = -\frac{1}{2} \implies \theta = 120^\circ$

2) $\sin 2\theta = \frac{\sqrt{3}}{2}$ $\leftarrow \cos^2 \theta + \sin^2 \theta = 1$
 $\cos \theta > 0$

平行四辺形 ABCD = $2 \Delta ABC$
 $= 2 \cdot \frac{1}{2} \cdot 7 \cdot 8 \sin \theta = 7 \cdot 8 \cdot \frac{\sqrt{3}}{2}$
 $= 28\sqrt{3} \dots (\text{エオカ})$



$BD = \sqrt{\frac{81}{4} + \frac{147}{4}}$
 $= \frac{2\sqrt{57}}{2} = \sqrt{57} \dots (\text{キク})$

(4) $\angle ACB = \alpha$ とおくと

$49 = 169 + 64 - 2 \cdot 13 \cdot 8 \cos \alpha$

$49 = 233 - 208 \cos \alpha$

$\cos \alpha = \frac{23}{26}$

$\sin^2 \alpha = 1 - \cos^2 \alpha = \frac{147}{26^2}$

$\sin \alpha > 0$
 $\sin \alpha = \frac{\sqrt{3}}{26} \dots (\text{ケコサシ})$

