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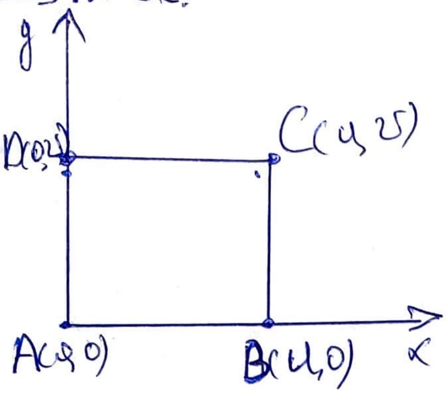
гр 519/2

1)

$A(0,0)$, $B(u,0)$, $C(u,v)$, $D(0,v)$, $y=-x^3+8$.

$S \to max?$



1) $C(u,v) \in$ I четв $\Rightarrow u>0, v>0$

$S = u \cdot v$

2) $v = -u^3+8$

$S(u) = u \cdot v = u \cdot (-u^3+8) = -u^4+8u$

$S(u) \to max$

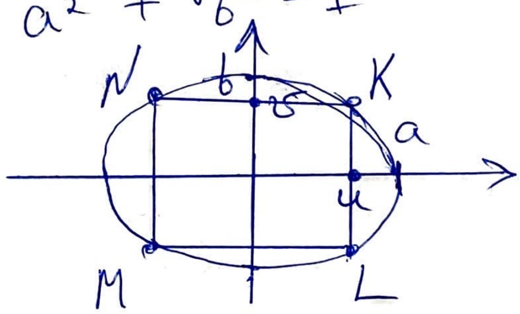
$S'(u) = -4(u^3+2) = 0$

$u^3 = 2$

$u = \sqrt[3]{2} \Rightarrow v = 6$

Ответ: $\underline{S = u \cdot v = 6 \cdot \sqrt[3]{2}}$

2) $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$



1) Пусть прям пересекает оси коор в т. $A(u,0)$ и $B(0,v)$

$S_{прям} = 4 \cdot u \cdot v$

$\dfrac{u^2}{a^2} + \dfrac{v^2}{b^2} = 1 \Rightarrow v = \dfrac{b}{a}\sqrt{a^2-u^2}$

$S(u) = 4 \cdot u \cdot \dfrac{b}{a}\sqrt{a^2-u^2}$

$S'(u) = \dfrac{4b}{a}\left(\sqrt{a^2-u^2} + \dfrac{u \cdot (-2u)}{2\sqrt{a^2-u^2}}\right) =$

$= \dfrac{4b}{a} \cdot \dfrac{a^2-2u^2}{\sqrt{a^2-u^2}} = 0$

$u^2 = \dfrac{a^2}{2} \Rightarrow u = \pm\dfrac{a}{\sqrt{2}}$

$u>0 \Rightarrow u = \dfrac{a}{\sqrt{2}}$, $v = \dfrac{b}{\sqrt{2}}$

Ответ: коор прям $N\left(-\dfrac{a}{\sqrt{2}}, \dfrac{b}{\sqrt{2}}\right)$, $K\left(\dfrac{a}{\sqrt{2}}, \dfrac{b}{\sqrt{2}}\right)$,
$M\left(-\dfrac{a}{\sqrt{2}}, -\dfrac{b}{\sqrt{2}}\right)$, $L\left(\dfrac{a}{\sqrt{2}}, -\dfrac{b}{\sqrt{2}}\right)$