# OKOMITOST PRAVACA I RAVNINE

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2. d

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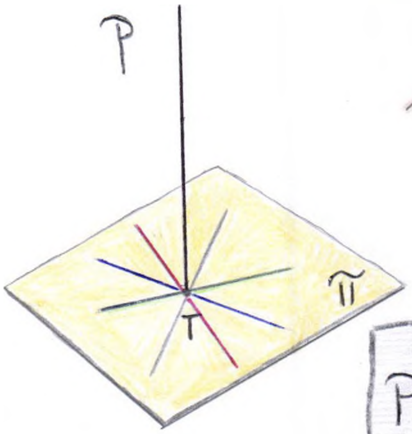



$\boxed{p \perp \pi}$

Neka je T probodište pravca p i ravnine π.

Pravac p <u>okomit</u> je na ravninu π ako je okomit na <u>svaki od pravaca</u> koji leže u ravnini π i koji <u>prolaze</u> točkom T.

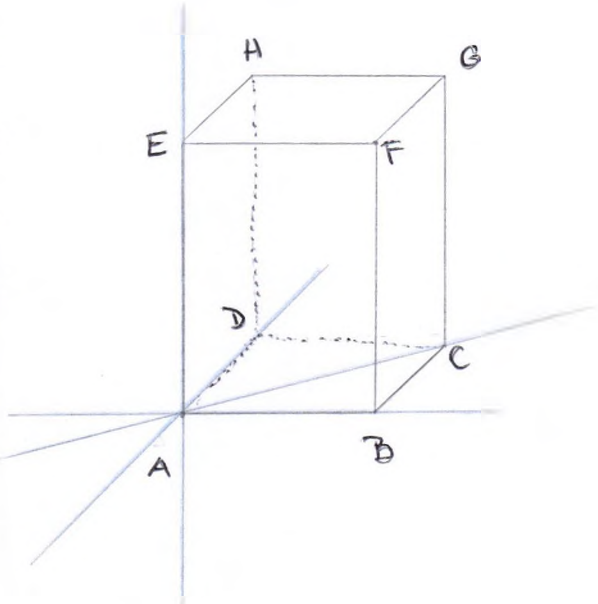
* Koji je pravac okomit na sve ostale pravce? Pogledaj zadanu skicu.

A. pravac AB

B. pravac AD

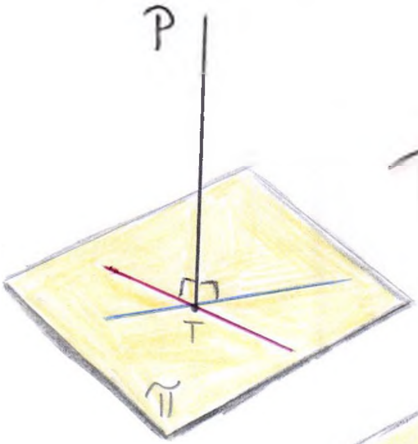
C. pravac AC

D. pravac AE

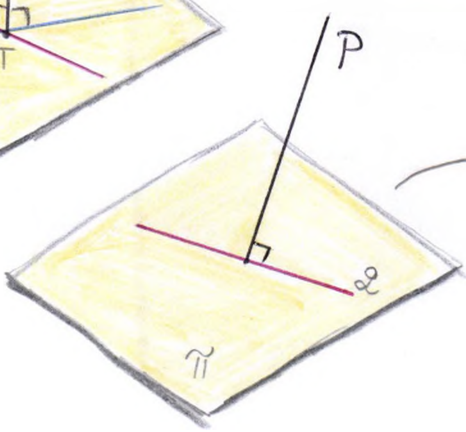



Pravci AB, AD i AC pripadaju ravnini ABC, a pravac AE okomit je na svaki od njih.

Točan odgovor je pod D.

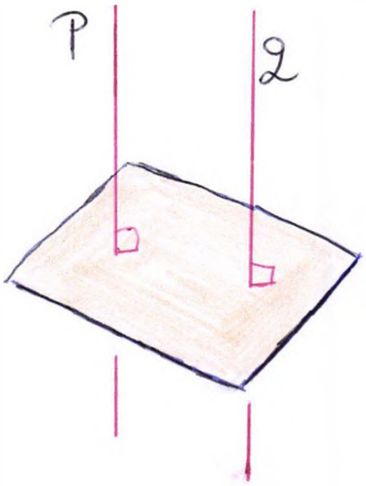


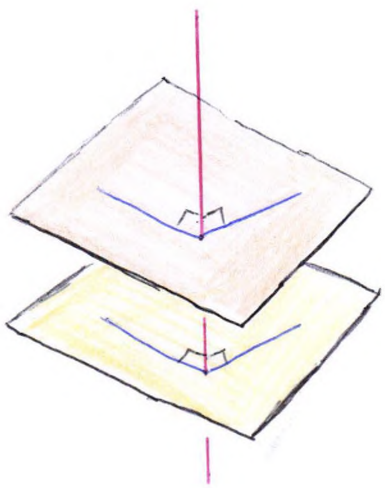

Da bi pravac p bio okomit na ravninu π, dovoljno je da bude <u>okomit</u> na <u>dva pravca</u> te ravnine koji prolaze probodištem T.




* Primijetimo kako nije dovoljno da pravac p bude okomit na jedan pravac ravnine koji prolazi probodištem.
Naime, svaki je pravac koji probada ravninu okomit na neki pravac te ravnine koji prolazi probodištem.

# PARALELNOST I OKOMITOST



① Ako je $p \perp \pi$ i $q \parallel p$, onda je $q \perp \pi$.

② Ako je $p \perp \pi$ i $q \perp \pi$, onda je $p \parallel q$.

③ Ako je $p \perp \pi$ i $\pi \parallel \rho$, onda je $p \perp \rho$.

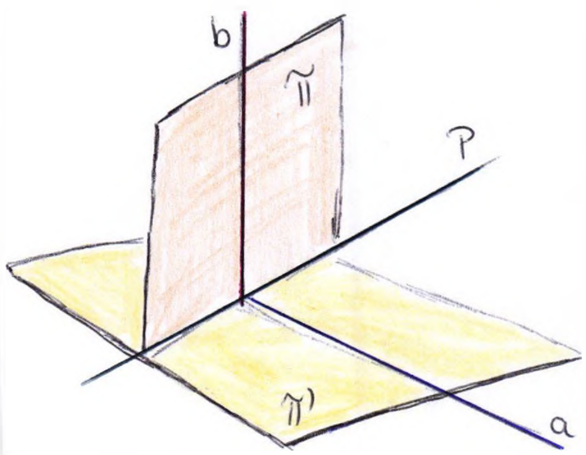
Riječima to možemo izreći ovako:

1) Ako je pravac okomit na ravninu, onda je svaki pravac paralelan s njim okomit na ravninu.

2) Dva pravca okomita na ravninu su paralelna.

3) Pravac okomit na ravninu okomit je na svaku ravninu paralelnu s njom.

# OKOMITOST RAVNINA




**OKOMITOST DVIJU RAVNINA**

Ravnina $\pi$ okomita je na ravninu $\pi'$ ako sadrži pravac koji je okomit na ravninu $\pi'$

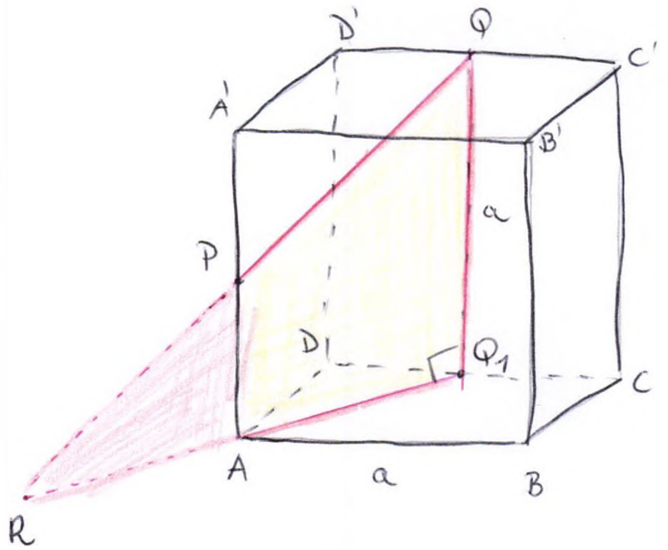
**SVOJSTVO OKOMITOSTI**

Ako je ravnina $\pi$ okomita na ravninu $\pi'$, onda je i ravnina $\pi'$ okomita na ravninu $\pi$.

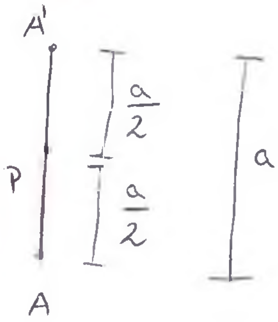
$$\pi \perp \pi'$$

* Točka P polovište je brida $\overline{AA_1}$, a točka Q brida $\overline{C_1D_1}$ kocke.

Odredi: $\overline{AP}$, $\overline{Q_1Q}$, $\overline{AQ_1}$, $\overline{PQ}$, $\overline{AQ}$, $\measuredangle Q$ i $\measuredangle R$.



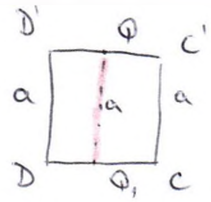

$\overline{AP}$:




polovište

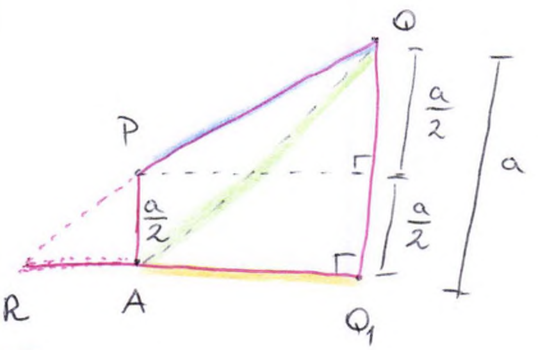
$$\overline{AP} = \frac{a}{2}$$

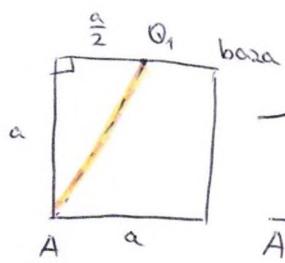
$\overline{Q_1Q}$:




$$\overline{Q_1Q} = a$$

↪ brid kocke




Pitagorin poučak

$\overline{AQ_1}$:

$$\overline{AQ_1}^2 = a^2 + \left(\frac{a}{2}\right)^2$$

$$\overline{AQ_1} = \sqrt{a^2 + \left(\frac{a}{2}\right)^2}$$

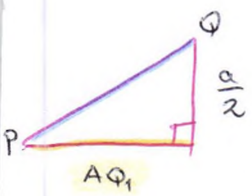
$$\overline{AQ_1} = \sqrt{a^2 + \frac{a^2}{4}}$$

$$\overline{AQ_1} = \sqrt{a^2\left(1 + \frac{1}{4}\right)}$$

$$\overline{AQ_1} = a\sqrt{\frac{5}{4}}$$

$$\overline{AQ_1} = \frac{a}{2}\sqrt{5}$$

$\overline{PQ}$:




$$\overline{PQ}^2 = \left(\overline{AQ_1}\right)^2 + \left(\frac{a}{2}\right)^2$$

$$\overline{PQ} = \sqrt{\left(\overline{AQ_1}\right)^2 + \left(\frac{a}{2}\right)^2}$$

$$\overline{PQ} = \sqrt{\left(\frac{a}{2}\sqrt{5}\right)^2 + \left(\frac{a}{2}\right)^2}$$

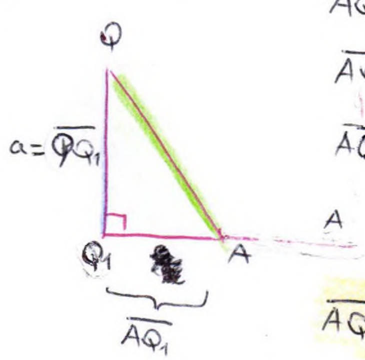
$$\overline{PQ} = \sqrt{a^2 \cdot \frac{5}{4} + \frac{a^2}{4}}$$

$$\overline{PQ} = \sqrt{\frac{a^2}{4}(5+1)}$$

$$\overline{PQ} = \frac{a}{2}\sqrt{6}$$

$$\cos = \frac{\text{priležeća}}{\text{hipotenuza}}$$

$\overline{AQ}$:




$$\overline{AQ}^2 = \overline{AQ_1}^2 + a^2$$

$$\overline{AQ} = \sqrt{\overline{AQ_1}^2 + a^2}$$

$$\overline{AQ} = \sqrt{\frac{5}{4}a^2 + a^2}$$

$$\overline{AQ} = \sqrt{\frac{9}{4}a^2}$$

$$\overline{AQ} = \frac{3}{2}a$$

$\measuredangle Q$:

$$\measuredangle Q = \cos \frac{\frac{a}{2}}{\frac{a}{2}\sqrt{6}} = \cos\left(\frac{\sqrt{6}}{6}\right)$$

$$\measuredangle Q = 59.59^\circ \rightarrow \measuredangle Q \approx 60^\circ$$

$\measuredangle R$:

$$\measuredangle R = 180^\circ - 90^\circ - \measuredangle Q$$

$$\measuredangle R = 30^\circ$$