

TEOREMA CELOR TREI PERPENDICULARE

Construiește perpendiculara de la un **punct** din afara unui plan la **dreapta** situată în plan

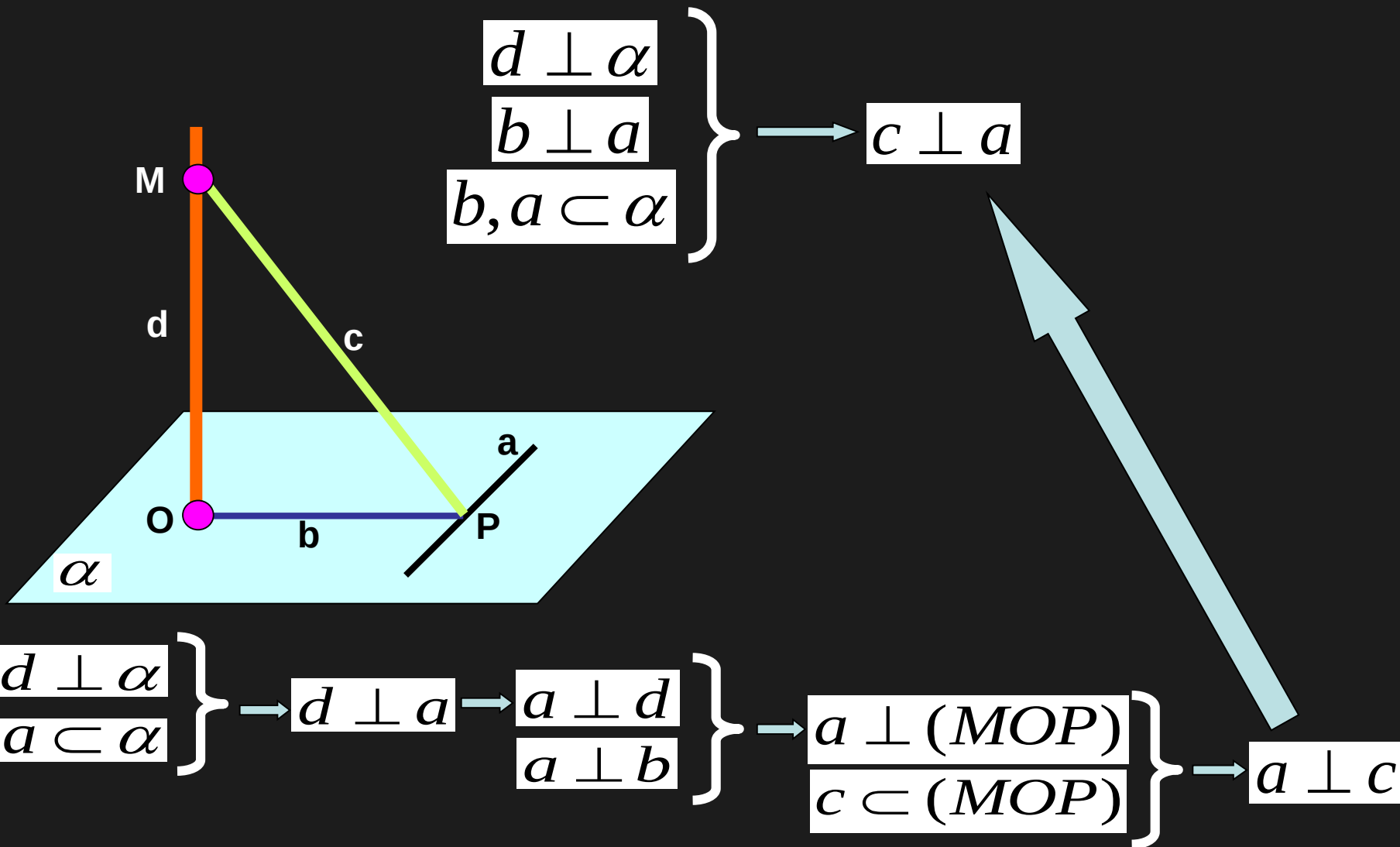
Lungimea acestei perpendiculare este **distanța** de la punct la dreaptă

Poate folosi la **înălțimi de triunghiuri** și deci la calcul de arii

Ne ocupăm numai de construcție

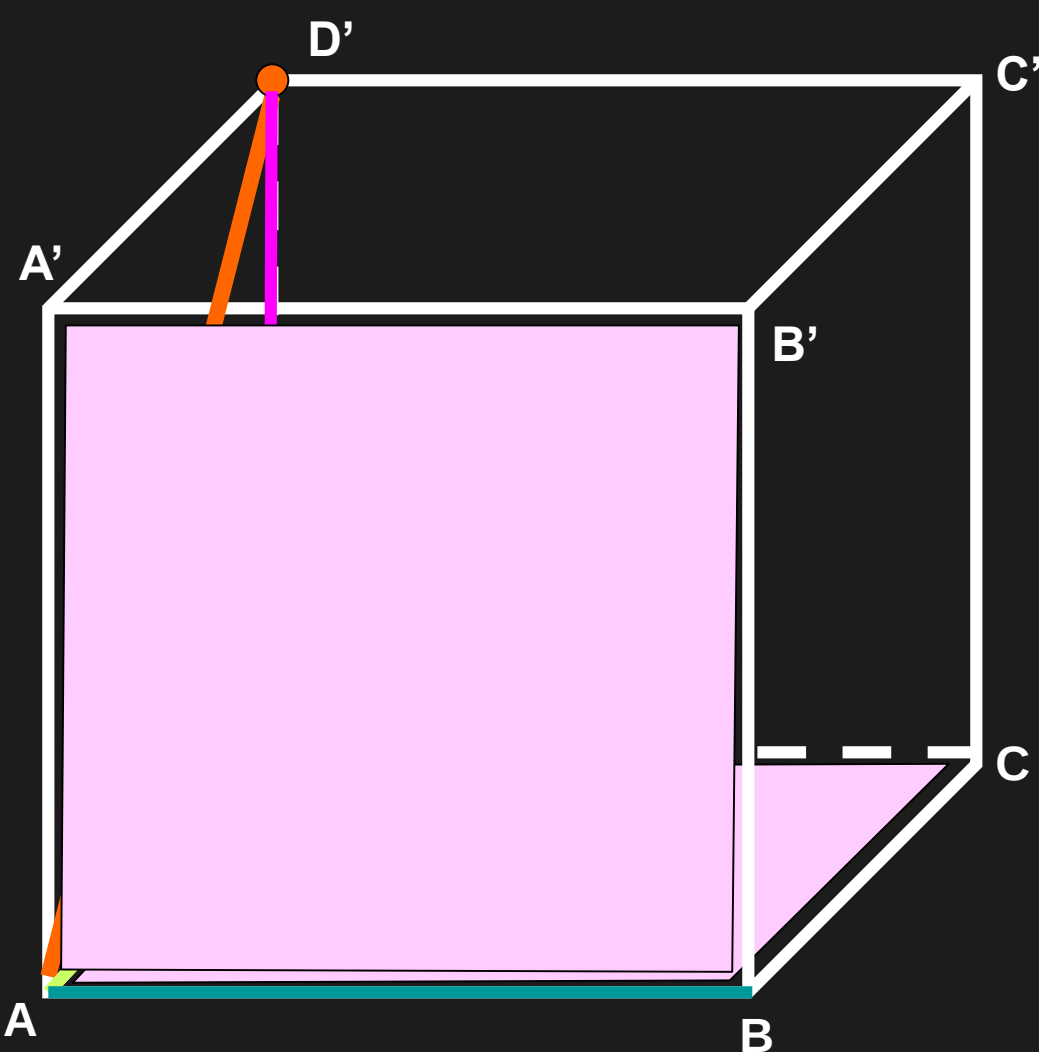
Calculul se face pe probleme în care
se dau date concrete

Pentru calcul, în general, se consideră triunghiul dreptunghic rezultat din construcție

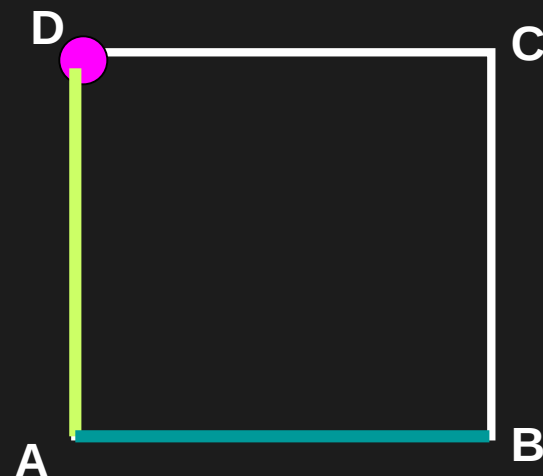


Constructiv procedez astfel:

“Din piciorul perpendiculararei pe plan duc perpendiculară pe dreaptă și unesc”



$d [D', AB]$



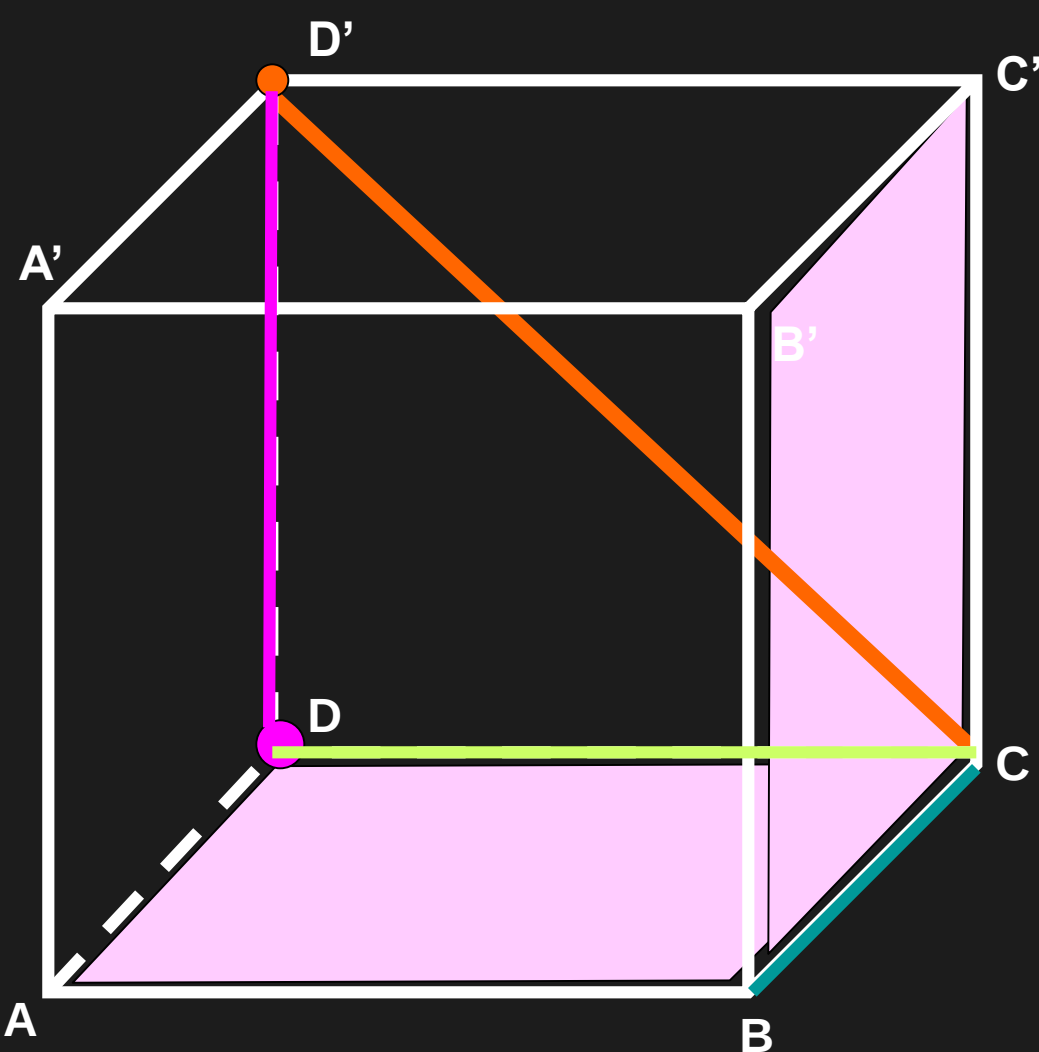
Din picior... **D**

Perpendicular pe ... **AB**

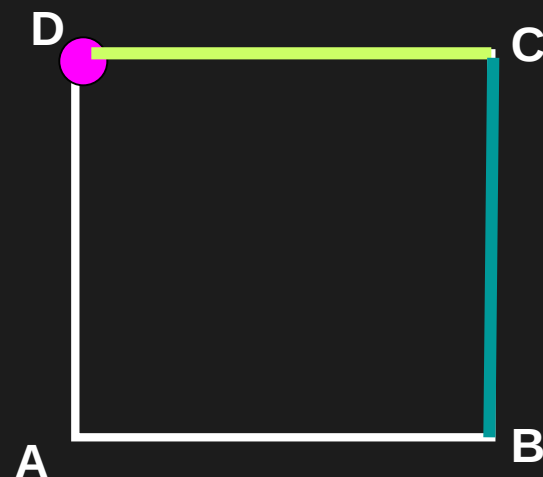
Adică ... **DA**

Și deci ... **D'A**

$$\left. \begin{array}{l} D'D \perp (ABC) \\ DA \perp AB \\ DA, AB \subset (ABC) \end{array} \right\} \xrightarrow{T3 \perp} D'A \perp AB \rightarrow D'A = d(D', AB)$$



$d[D', CB]$



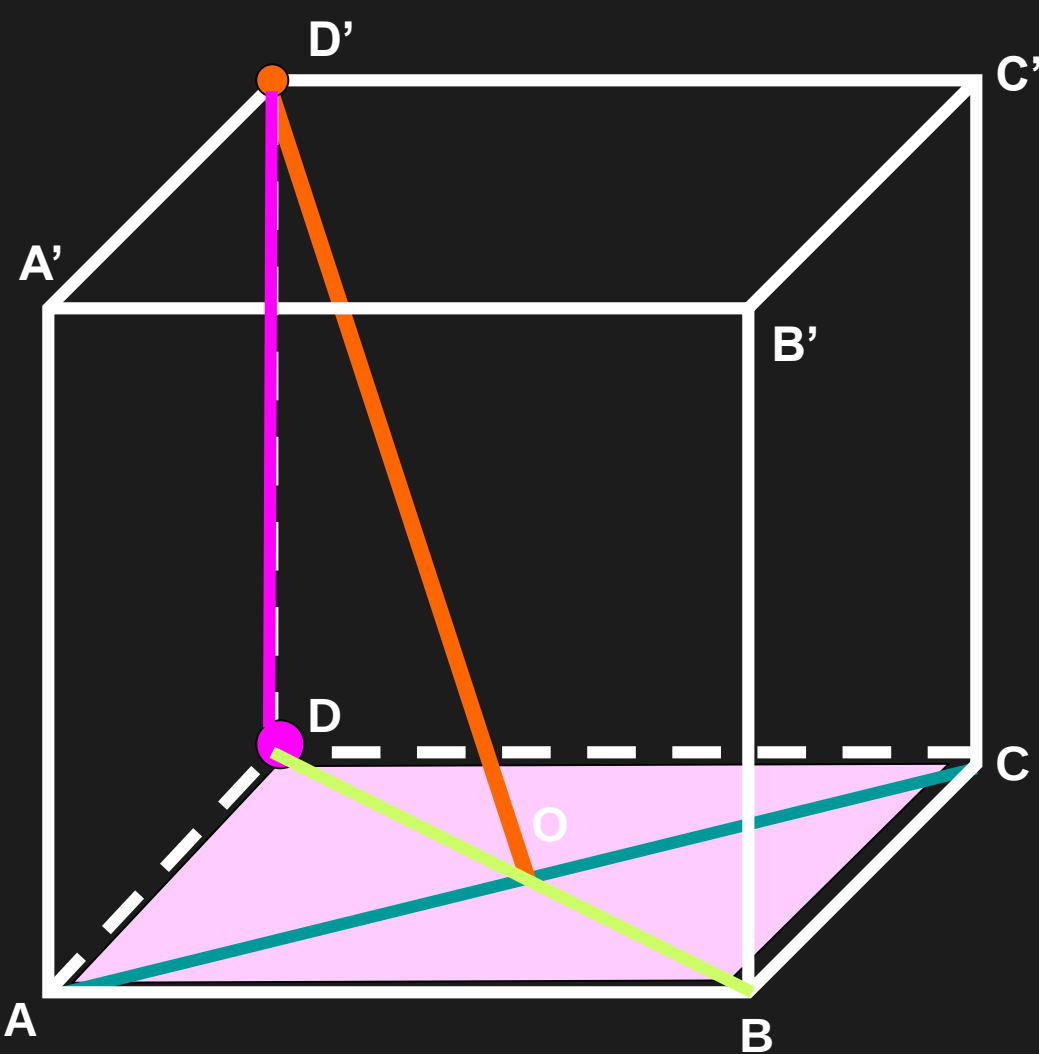
Din picior... **D**

Perpendicular pe ... **CB**

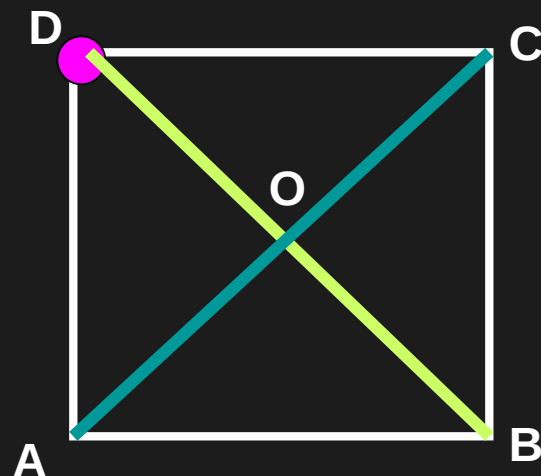
Adică ... **DC**

Și deci ... **D'C**

$$\left. \begin{array}{l} D'D \perp (ABC) \\ DC \perp BC \\ DC, BC \subset (ABC) \end{array} \right\} \begin{array}{l} T3 \perp \\ \longrightarrow \end{array} D'C \perp BC \longrightarrow D'C = d(D', BC)$$



$d [D', AC]$



Din picior... **D**

Perpendicular pe ... **CA**

Adică ... **DO**

Și deci ... **D'O**

$$D'D \perp (ABC)$$

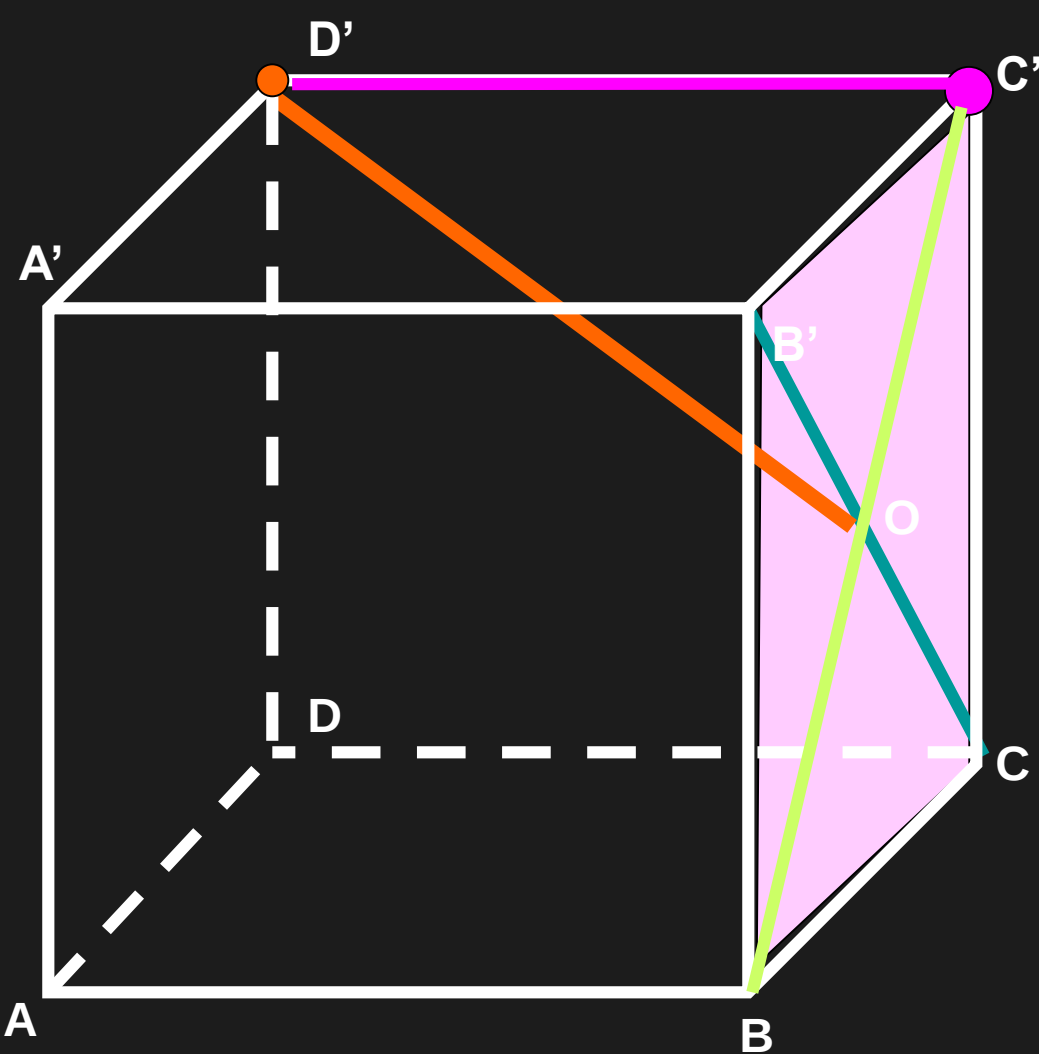
$$DO \perp AC$$

$$DO, AC \subset (ABC)$$

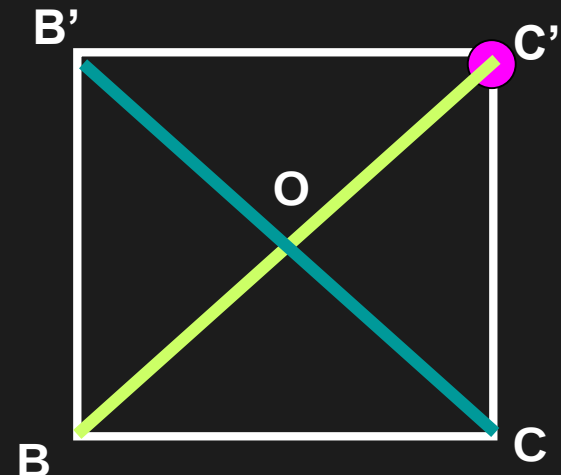
$T3 \perp$

$$D'O \perp AC$$

$$D'O = d(D', AC)$$



$d[D', CB']$



Din picior... C'

Perpendicular pe ... CB'

Adică ... $C'O$

Și deci ... $D'O$

$$D'C' \perp (BCC')$$

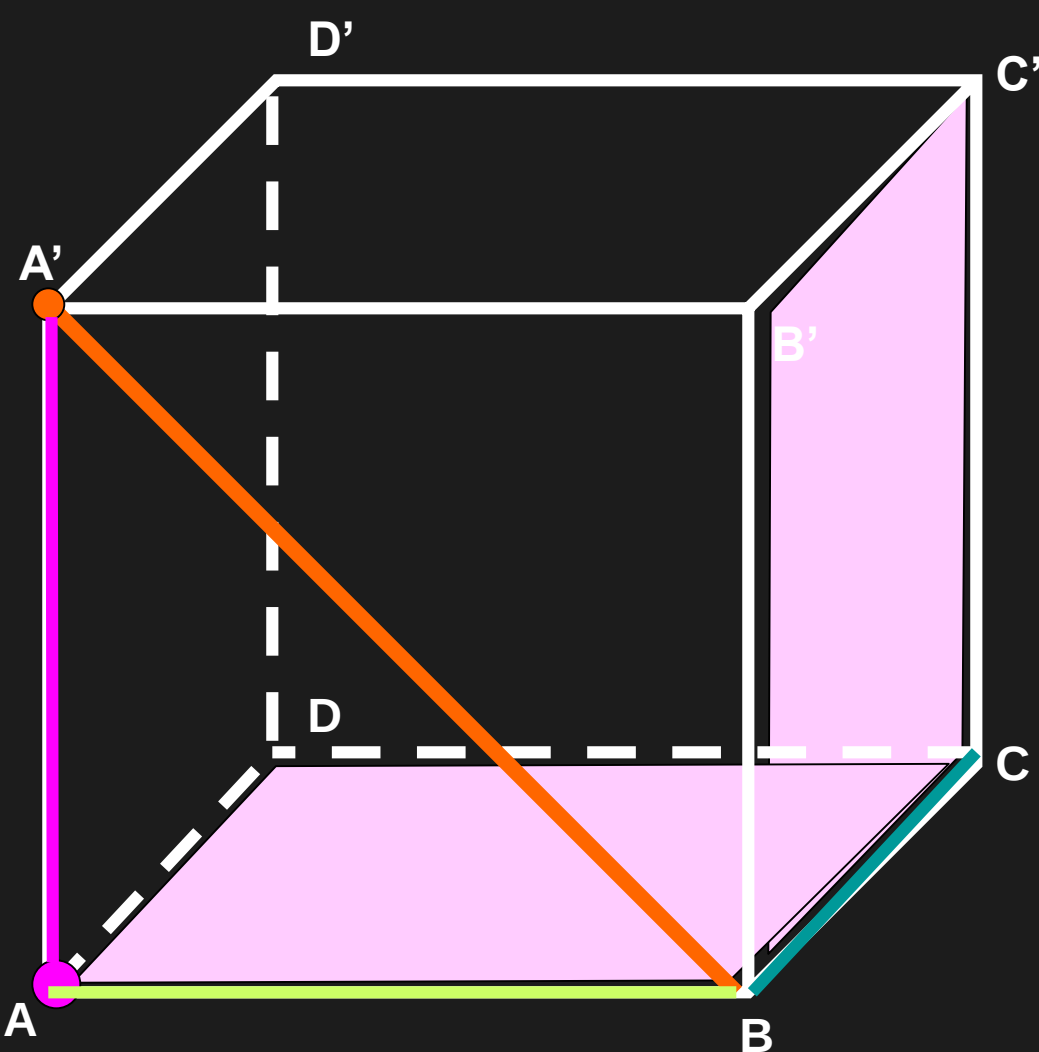
$$C'O \perp CB'$$

$$C'O, CB' \subset (BCC')$$

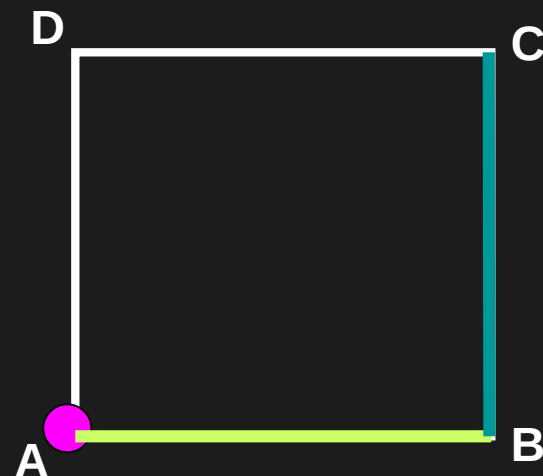
$T3 \perp$

$$C'O \perp CB'$$

$$D'O = d(D', CB')$$



$d[A', CB]$



Din picior... A

Perpendicular pe ... CB

Adică ... AB

Și deci ... $A'B$

$$A'A \perp (ABC)$$

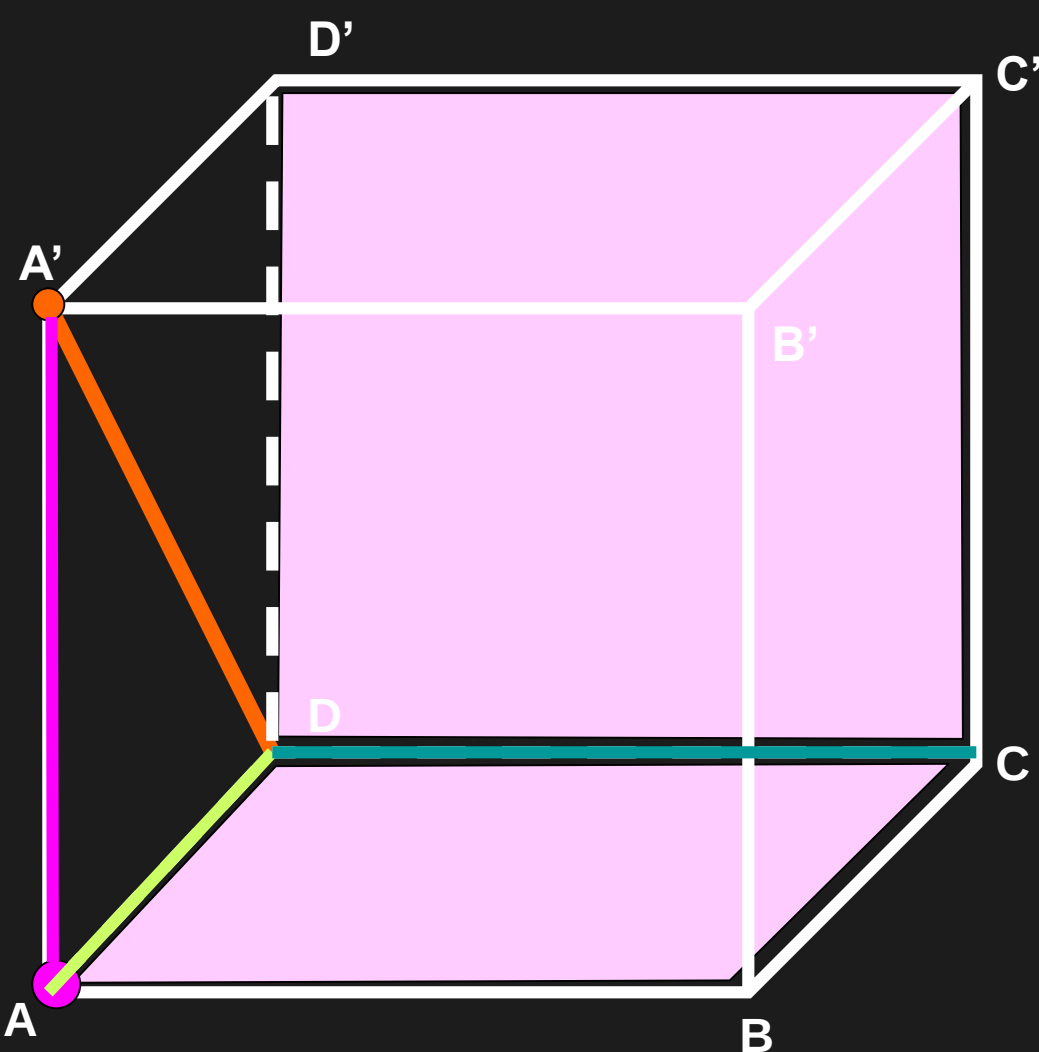
$$AB \perp BC$$

$$AB, BC \subset (ABC)$$

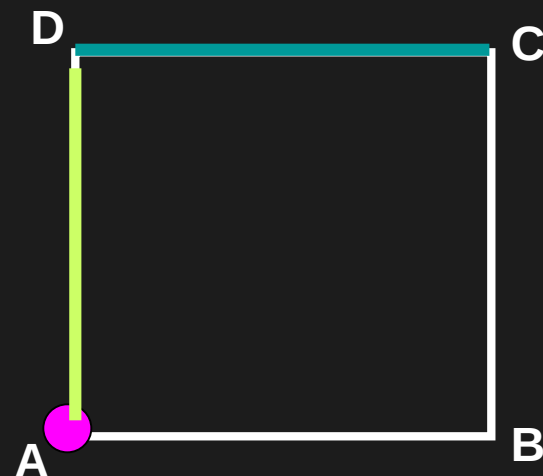
$$T3 \perp$$

$$A'B \perp BC$$

$$A'B = d(A', BC)$$



$d[A', DC]$



Din picior... **A**

Perpendicular pe ... **DC**

Adică ... **AD**

Și deci ... **A'D**

$$A'A \perp (ABC)$$

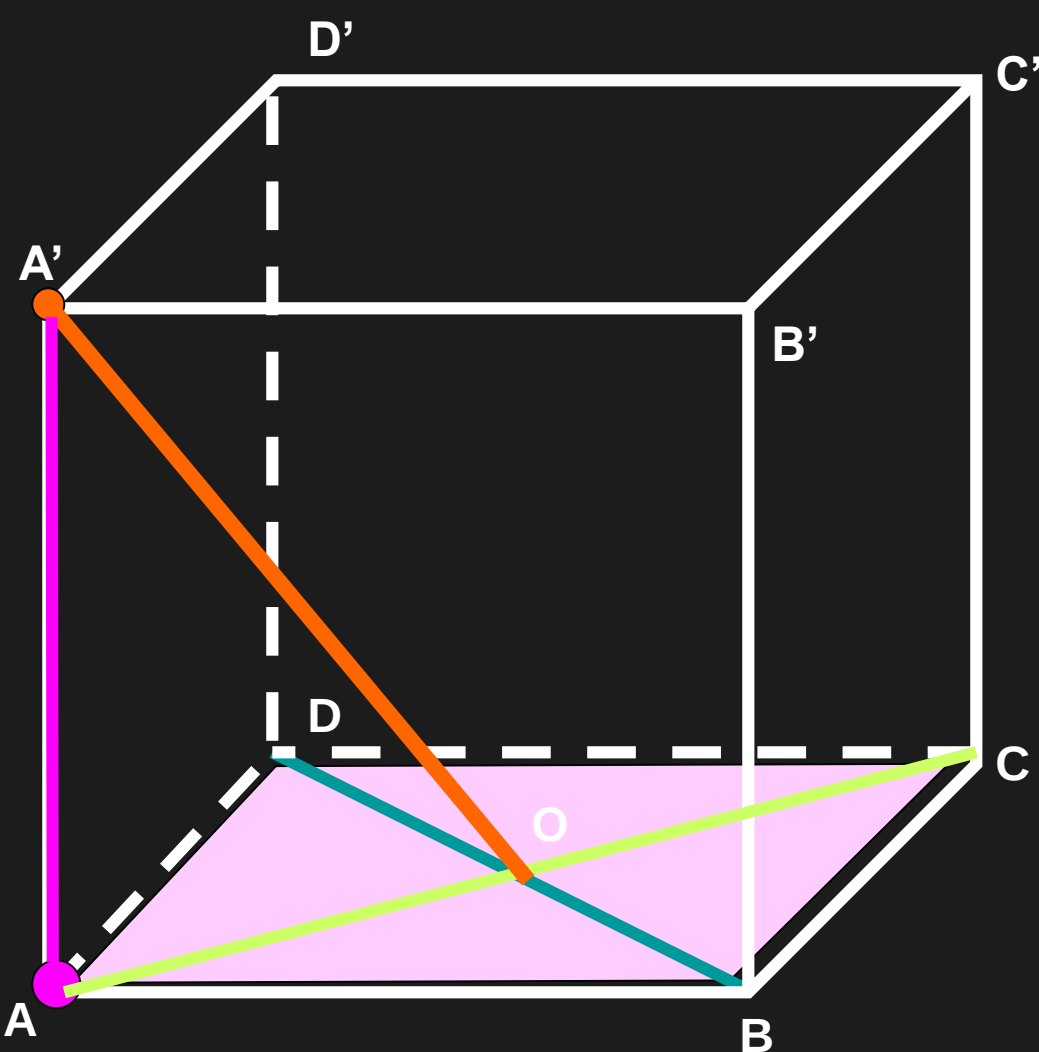
$$AD \perp DC$$

$$AD, DC \subset (ABC)$$

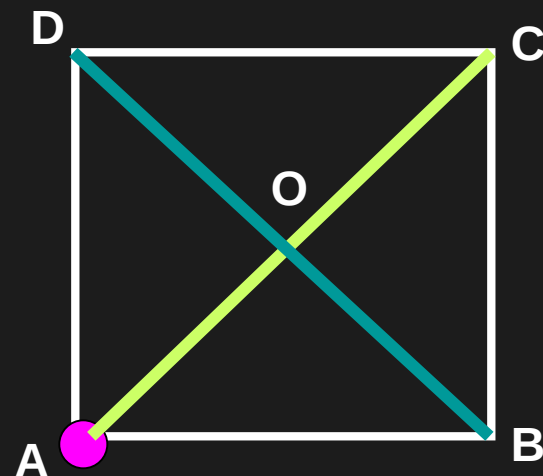
$T3 \perp$

$$A'D \perp DC$$

$$A'D = d(A', DC)$$



$d[A', DB]$



Din picior... **A**

Perpendicular pe ... **DB**

Adică ... **AO**

Și deci ... **A'O**

$$A'A \perp (ABC)$$

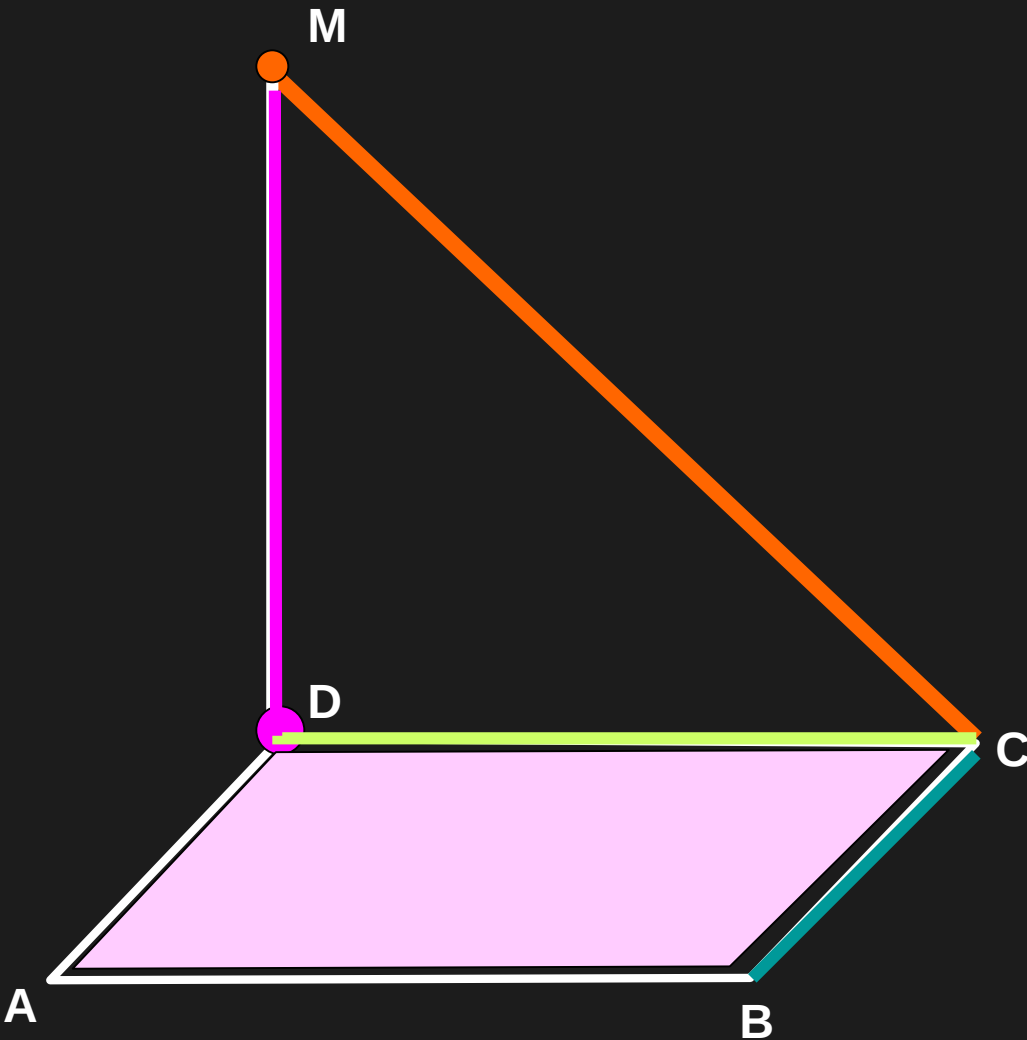
$$AO \perp DB$$

$$AO, DB \subset (ABC)$$

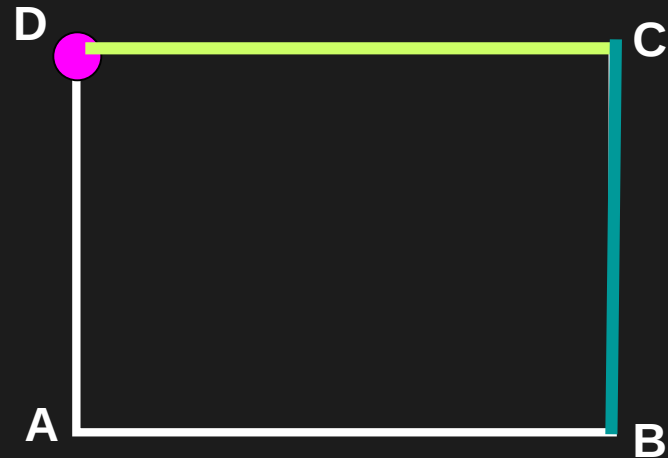
$$T3 \perp$$

$$A'O \perp DB$$

$$A'O = d(A', DB)$$



$d[M, CB]$



Din picior... **D**

Perpendicular pe ... **CB**

Adică ... **DC**

Și deci ... **MC**

$$MD \perp (ABC)$$

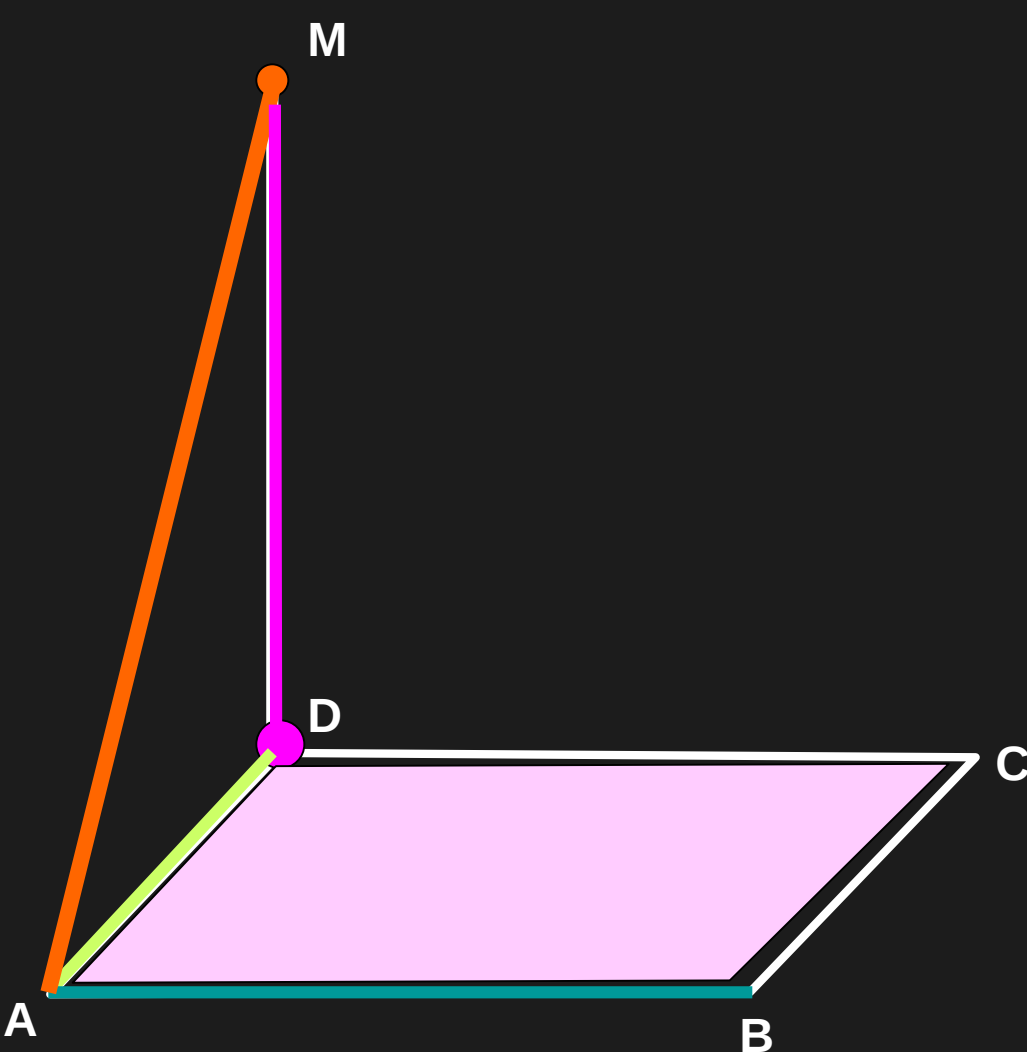
$$DC \perp BC$$

$$DC, BC \subset (ABC)$$

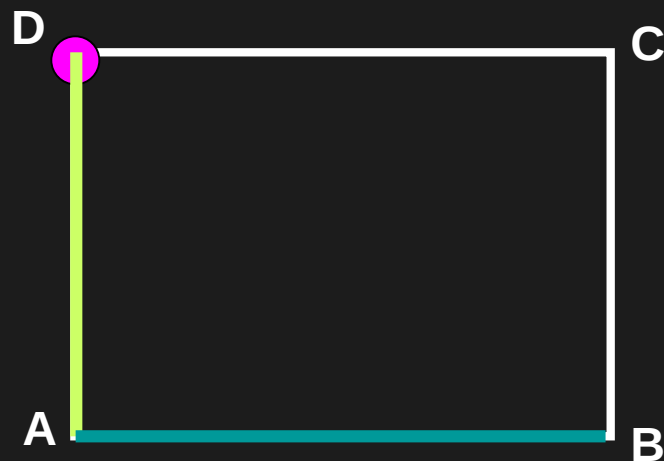
$$T3 \perp$$

$$MC \perp BC$$

$$MC = d(M, BC)$$



$d [M, AB]$



Din picior... **D**

Perpendicular pe ... **AB**

Adică ... **DA**

Și deci ... **MA**

$$MD \perp (ABC)$$

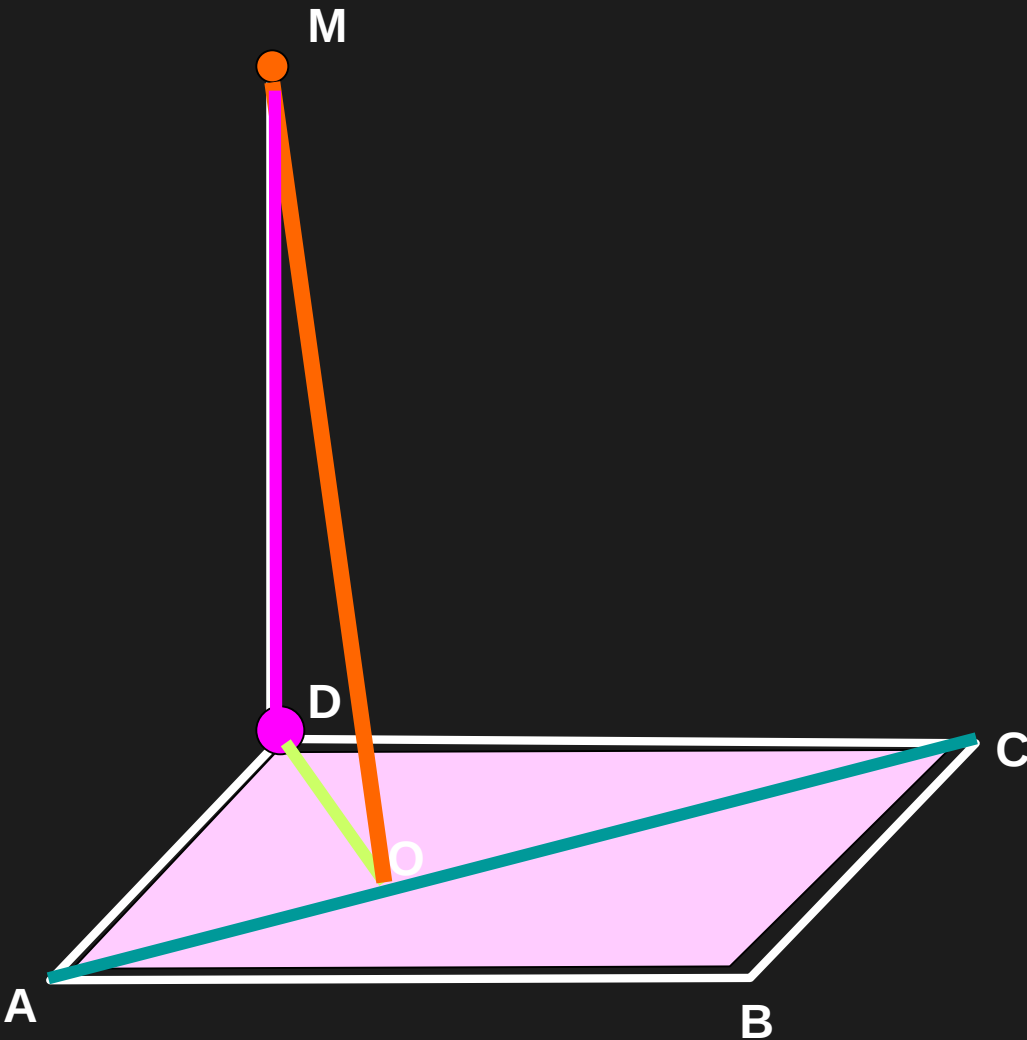
$$DA \perp AB$$

$$DA, AB \subset (ABC)$$

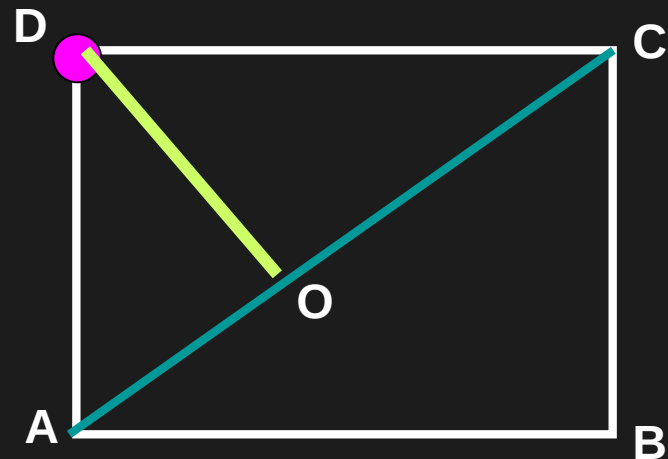
$$T3 \perp$$

$$MA \perp AB$$

$$MA = d(M, AB)$$



$d [M, AC]$



Din picior... **D**

Perpendicular pe ... AC

Adică ... **DO**

Și deci ... **MO**

$$MD \perp (ABC)$$

$$DO \perp AC$$

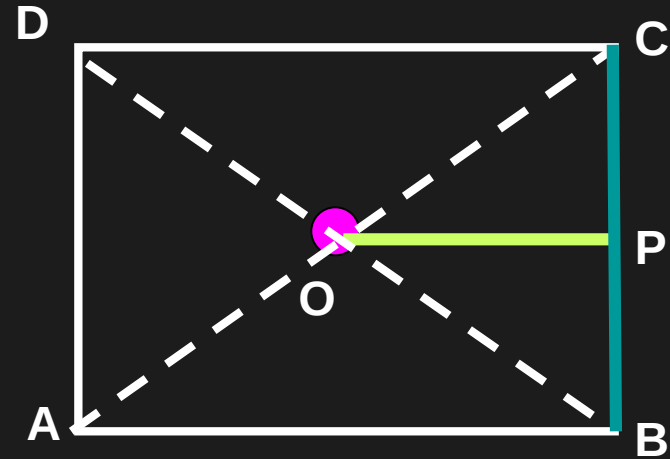
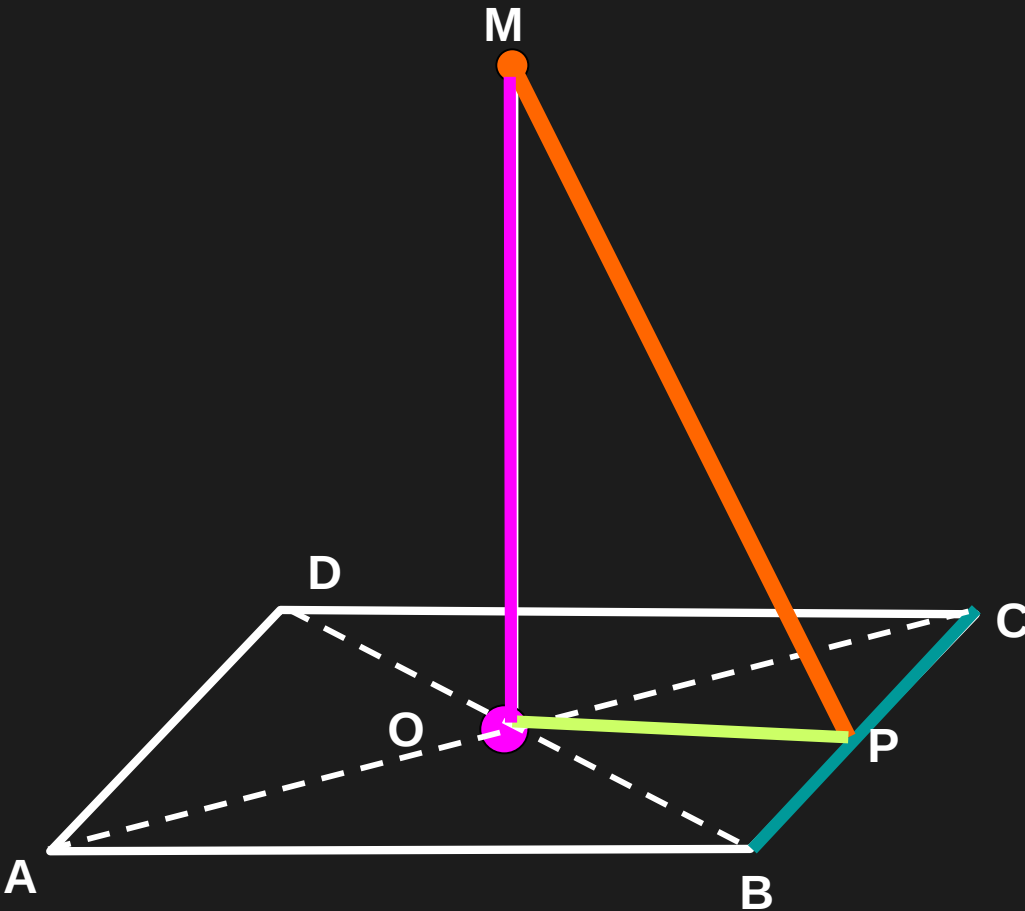
$$DO, AC \subset (ABC)$$

$T3 \perp$

$$MO \perp AC$$

$$MO = d(M, AC)$$

$d[M, BC]$



Din picior... **O**

Perpendicular pe ... **BC**

Adică ... **OP**

Și deci ... **MP**

$$MO \perp (ABC)$$

$$OP \perp BC$$

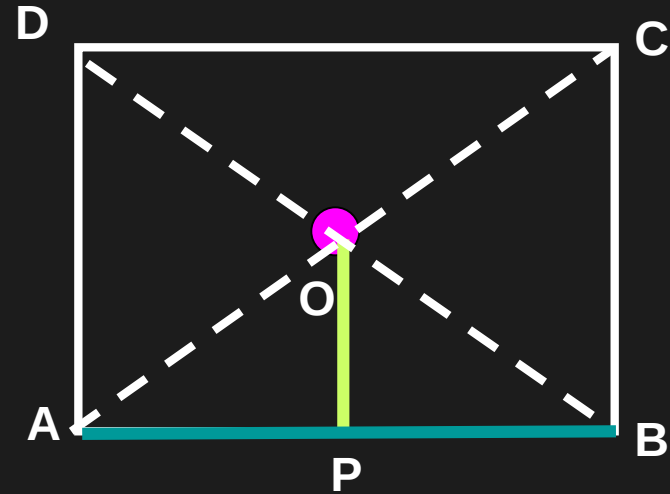
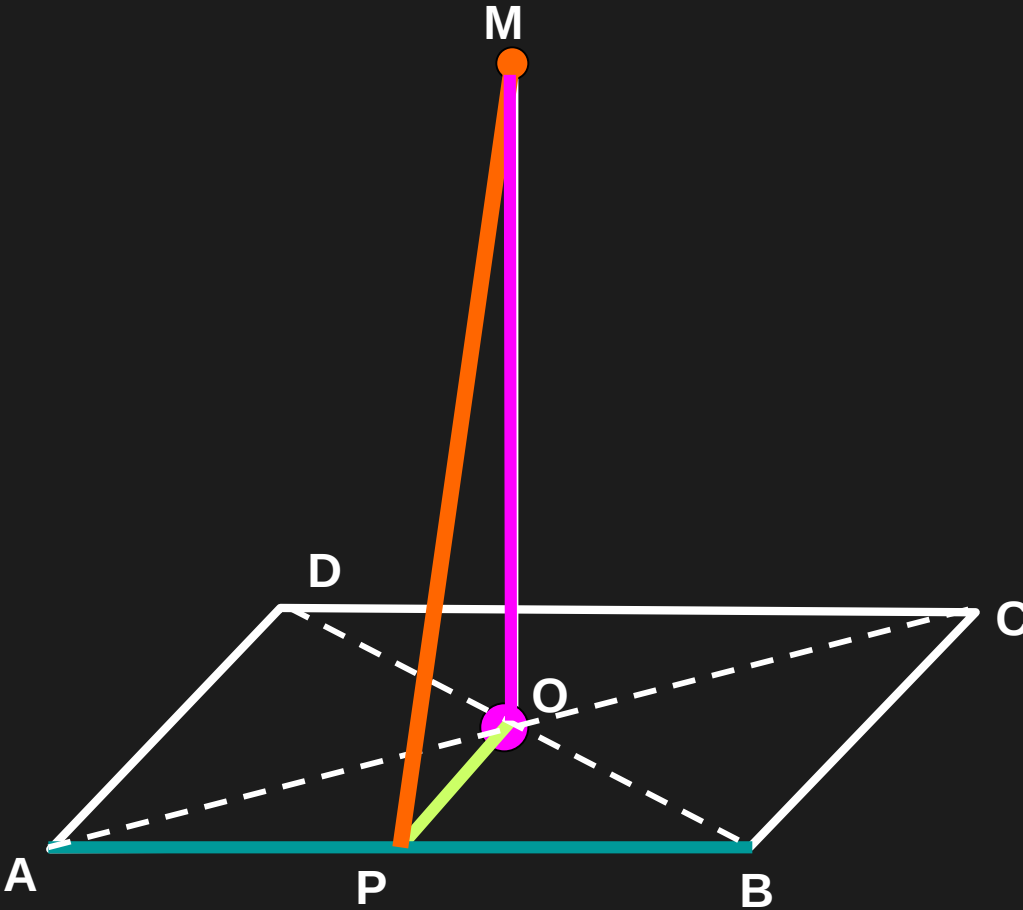
$$OP, BC \subset (ABC)$$

$$T3 \perp$$

$$MP \perp BC$$

$$MP = d(M, BC)$$

$d[M, AB]$



Din picior... O

Perpendicular pe ... AB

Adică ... OP

Și deci ... MP

$$MO \perp (ABC)$$

$$OP \perp AB$$

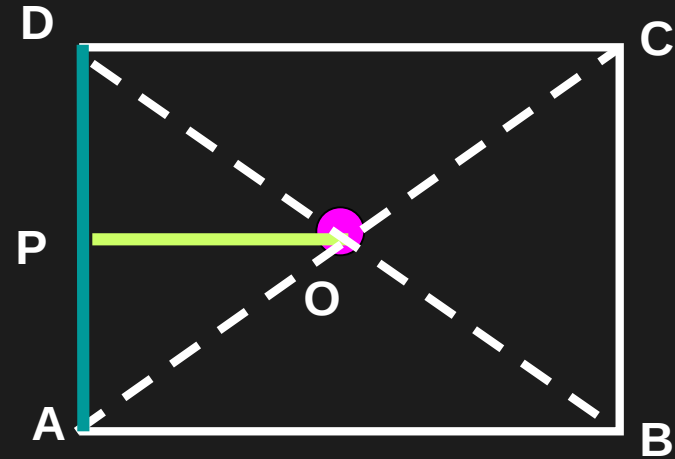
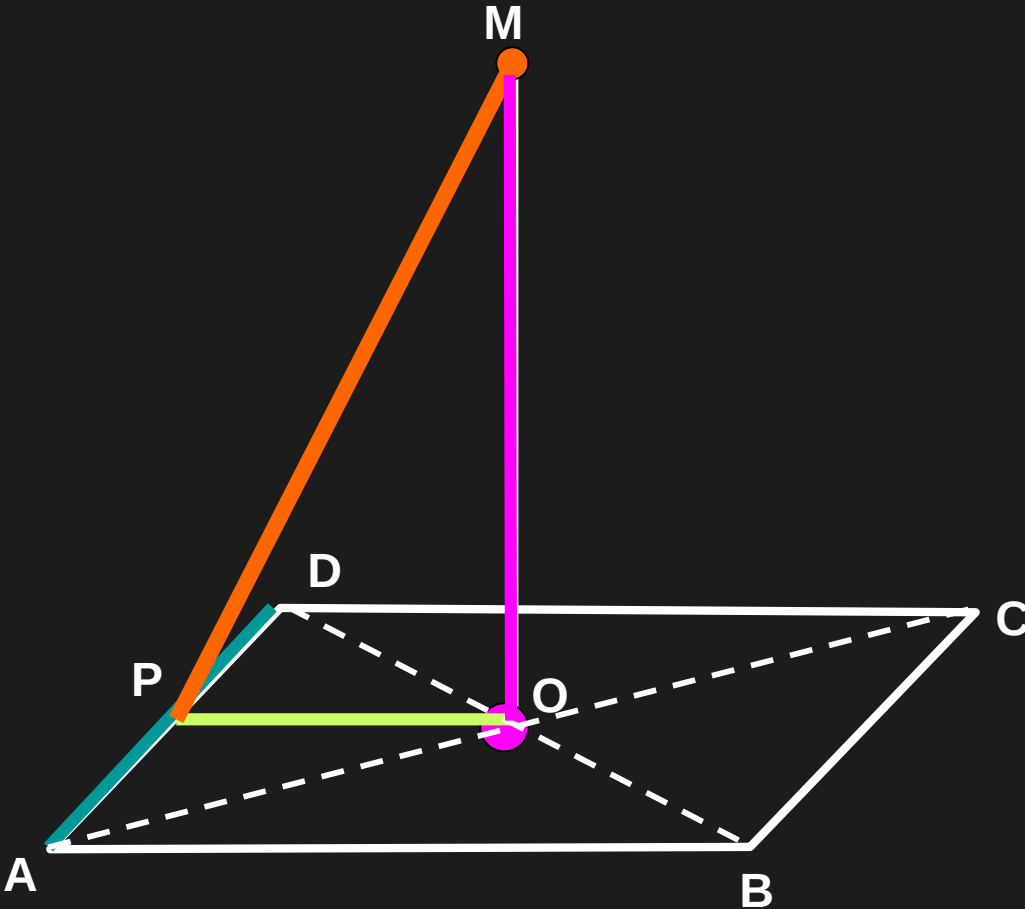
$$OP, AB \subset (ABC)$$

$$T3 \perp$$

$$MP \perp AB$$

$$MP = d(M, AB)$$

$d[M, AD]$



Din picior... **O**

Perpendicular pe ... **AD**

Adică ... **OP**

Și deci ... **MP**

$$MO \perp (ABC)$$

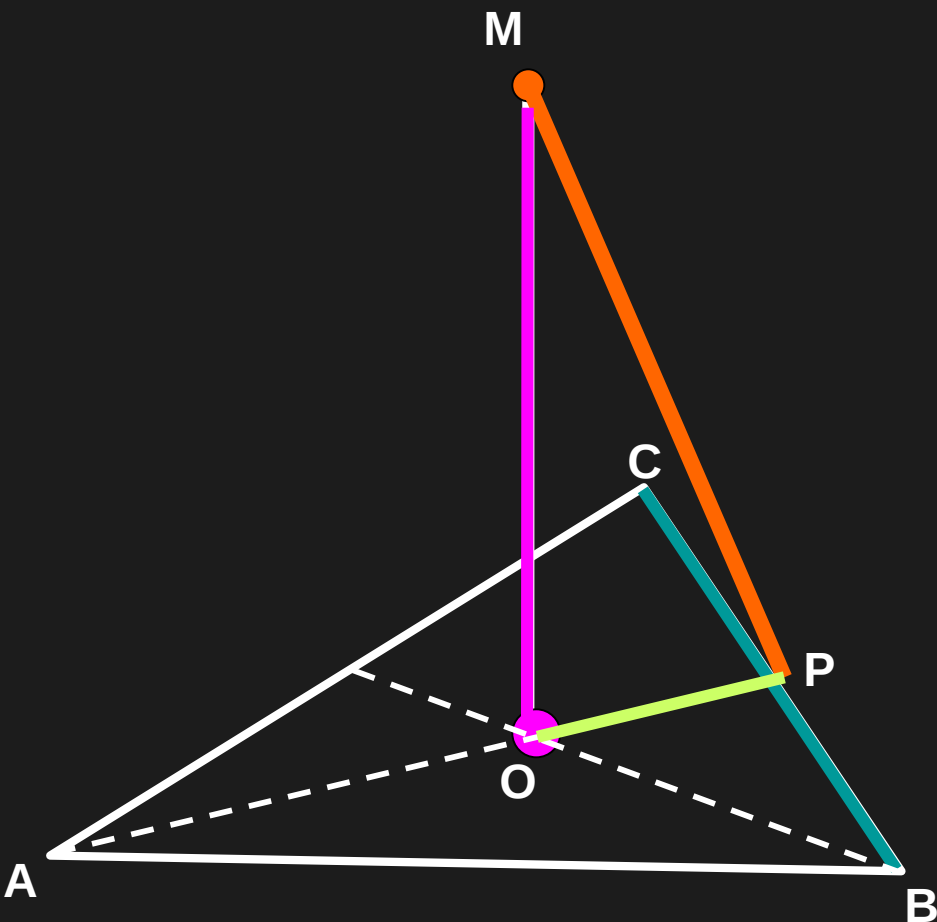
$$OP \perp AD$$

$$OP, AD \subset (ABC)$$

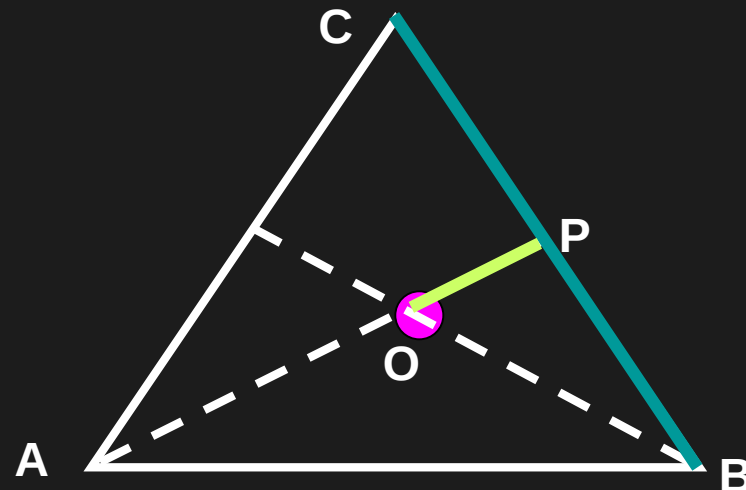
$$T3 \perp$$

$$MP \perp AD$$

$$MP = d(M, AD)$$



$d [M, BC]$



Din picior... **O**

Perpendicular pe ... **BC**

Adică ... **OP**

Și deci ... **MP**

$$MO \perp (ABC)$$

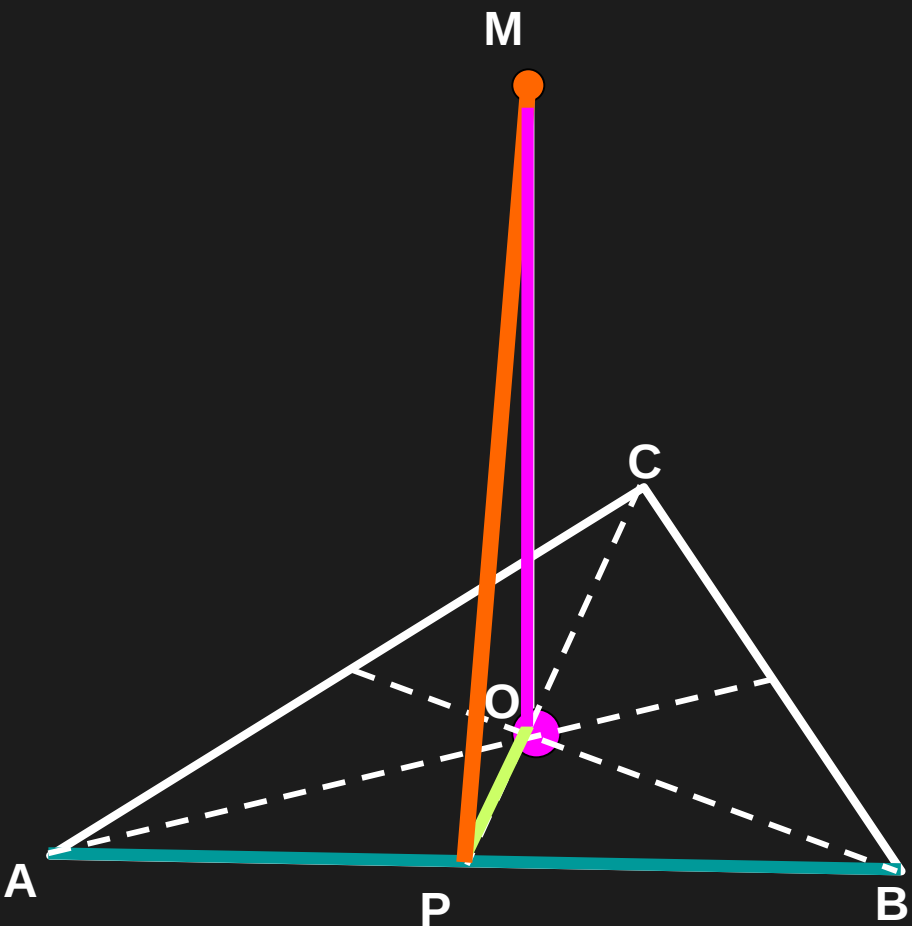
$$OP \perp BC$$

$$OP, BC \subset (ABC)$$

$$T3 \perp$$

$$MP \perp BC$$

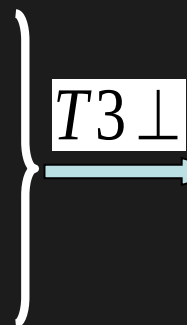
$$MP = d(M, BC)$$



$$MO \perp (ABC)$$

$$OP \perp AB$$

$$OP, AB \subset (ABC)$$



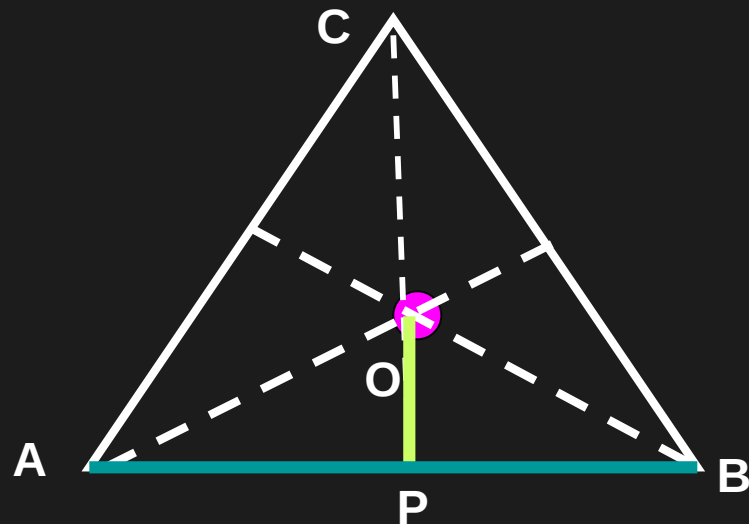
$$T3 \perp$$

$$MP \perp AB$$



$$MP = d(M, AB)$$

$$d [M, AB]$$



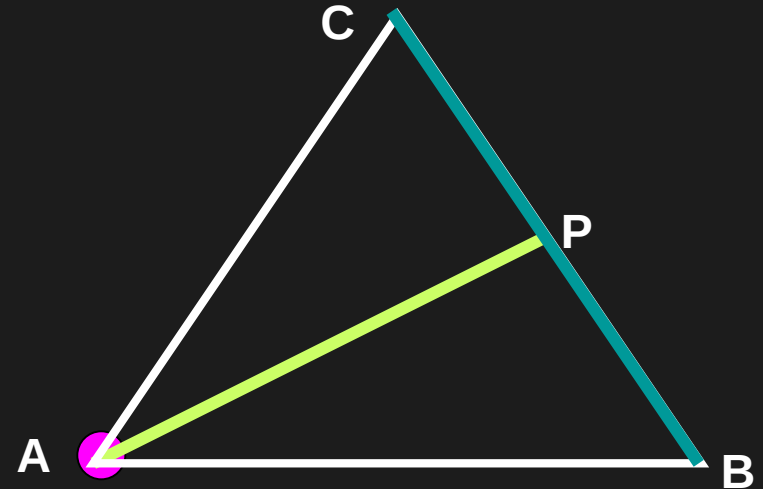
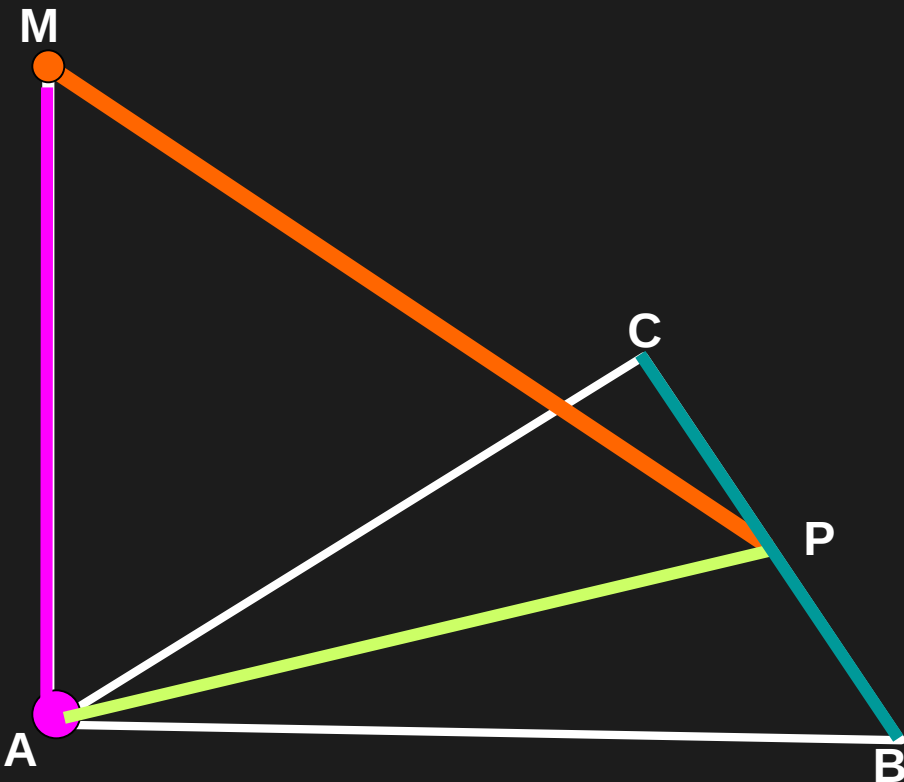
Din picior... **O**

Perpendicular pe ... **AB**

Adică ... **OP**

Și deci ... **MP**

$d[M, BC]$



Din picior... **A**

Perpendicular pe ... **BC**

Adică ... **AP**

Și deci ... **MP**

$$MA \perp (ABC)$$

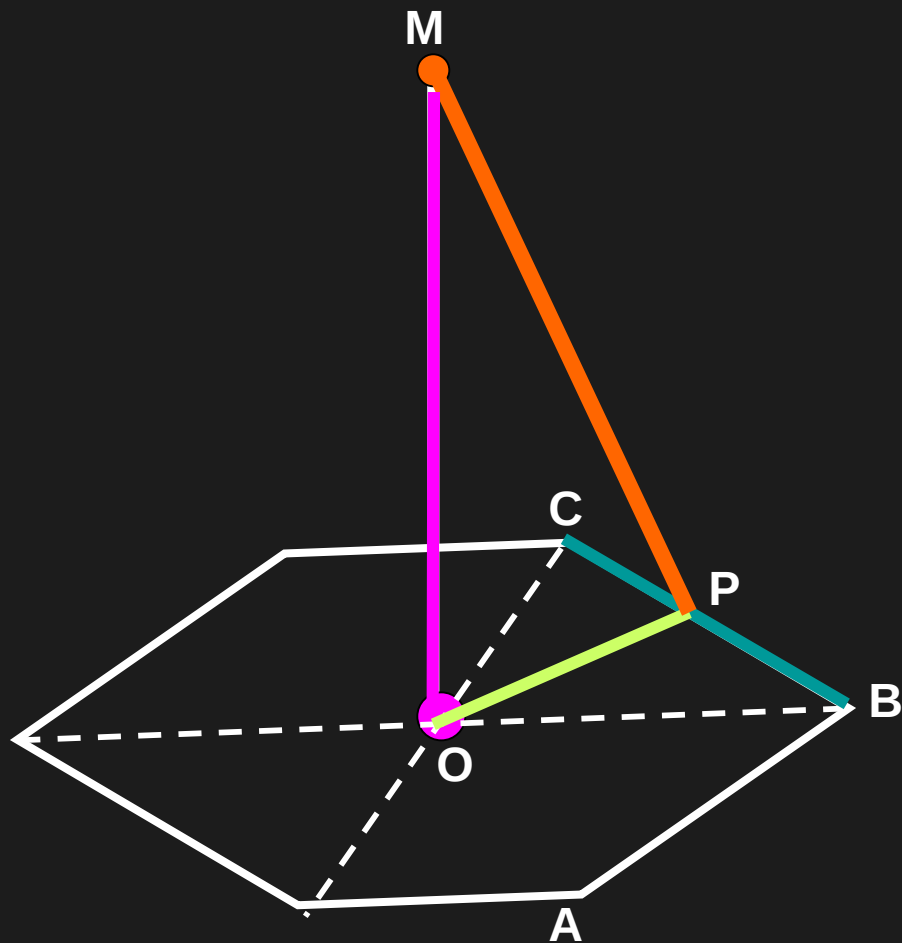
$$AP \perp BC$$

$$AP, BC \subset (ABC)$$

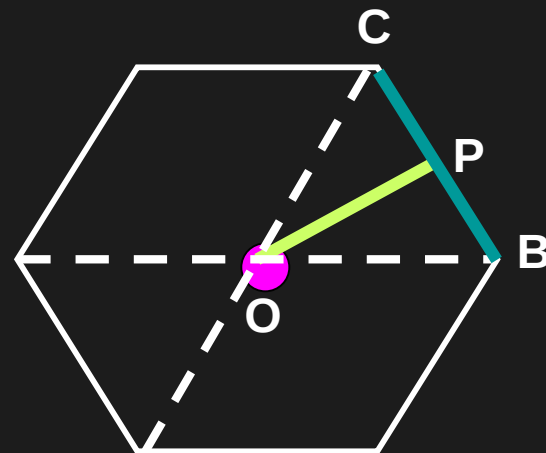
$$T3 \perp$$

$$MP \perp BC$$

$$MP = d(M, BC)$$



$d [M, BC]$



Din picior... **O**

Perpendicular pe ... **BC**

Adică ... **OP**

Și deci ... **MP**

$$MO \perp (ABC)$$

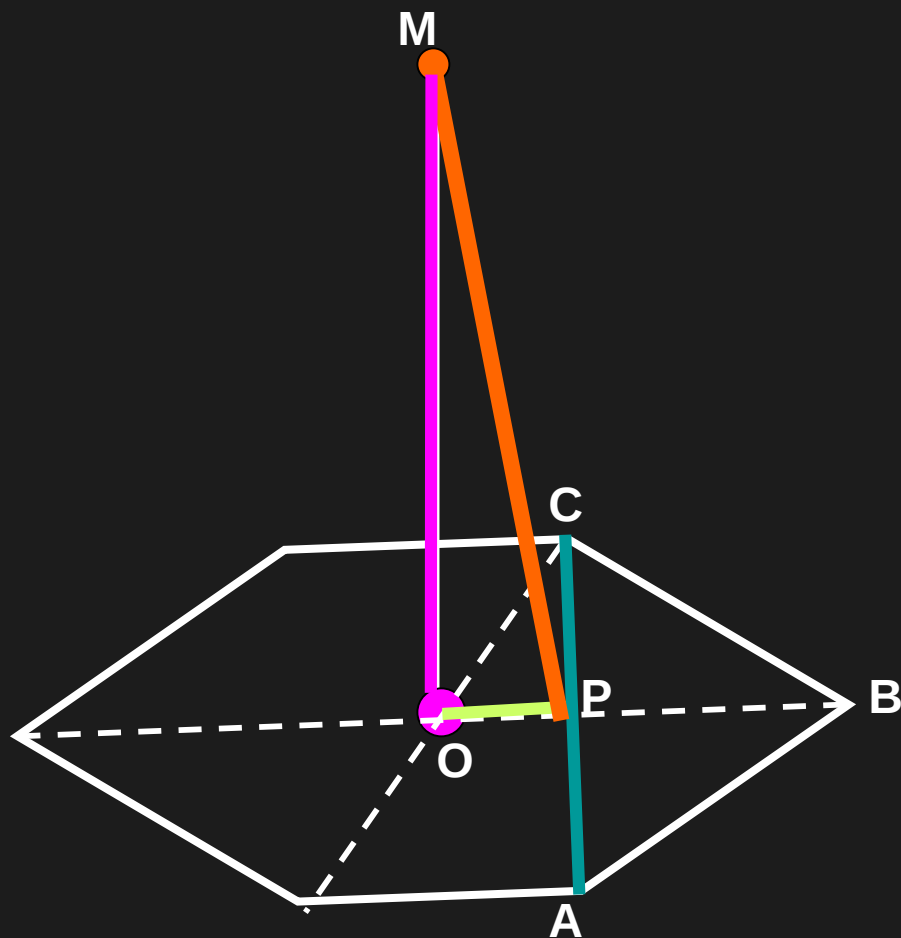
$$OP \perp BC$$

$$OP, BC \subset (ABC)$$

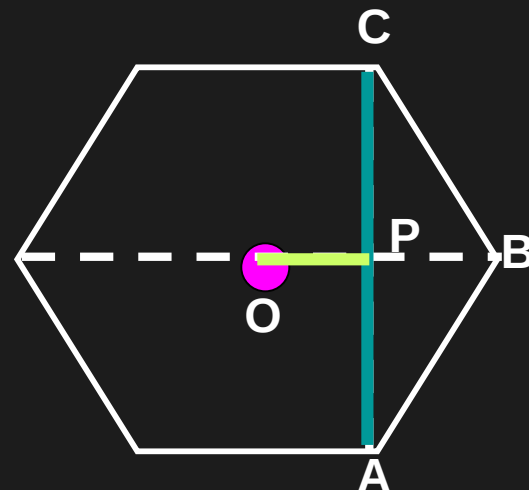
$T3 \perp$

$$MP \perp BC$$

$$MP = d(M, BC)$$



$d[M, AC]$



Din picior... **O**

Perpendicular pe ... **AC**

Adică ... **OP**

Și deci ... **MP**

$$MO \perp (ABC)$$

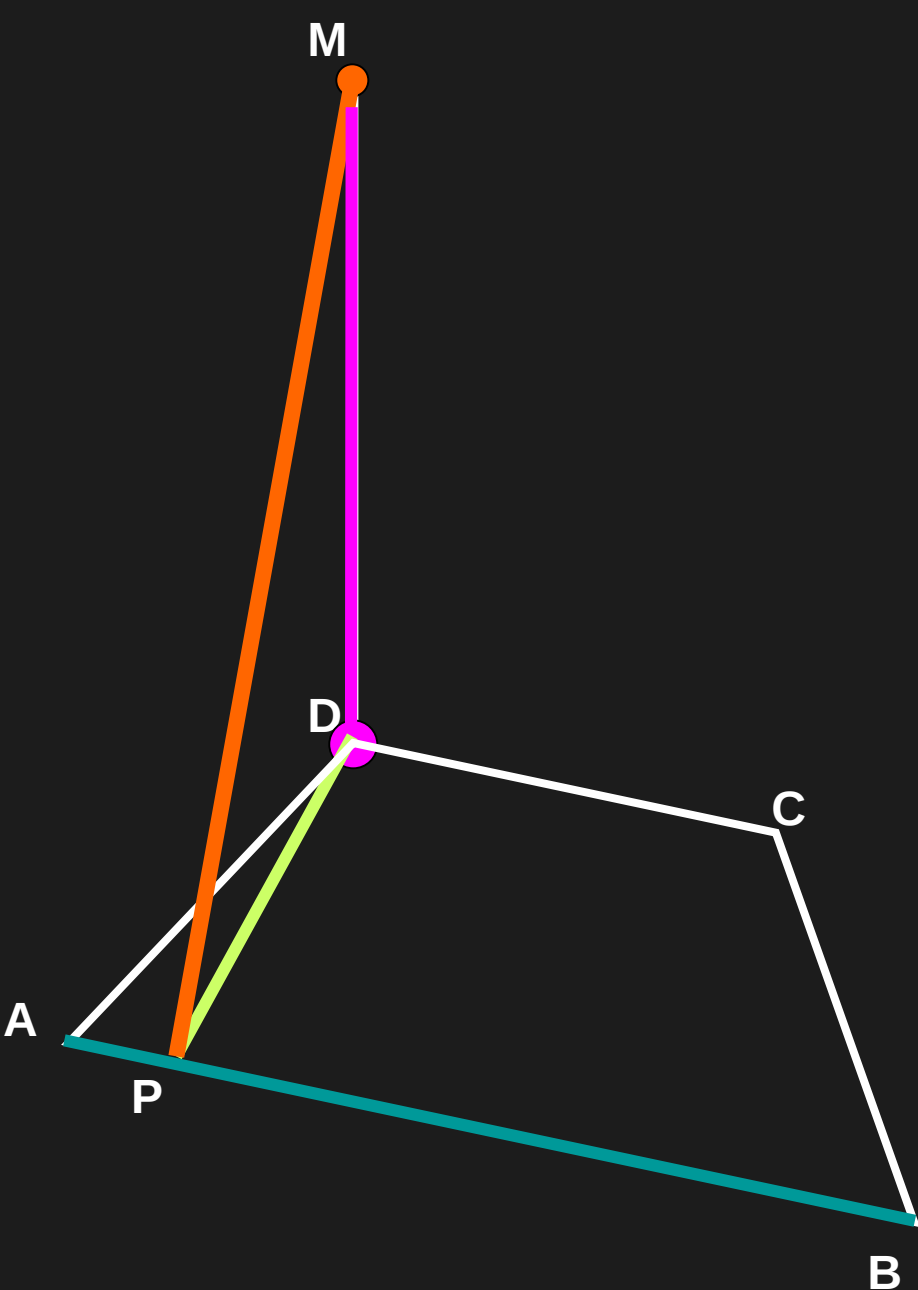
$$OP \perp AC$$

$$OP, AC \subset (ABC)$$

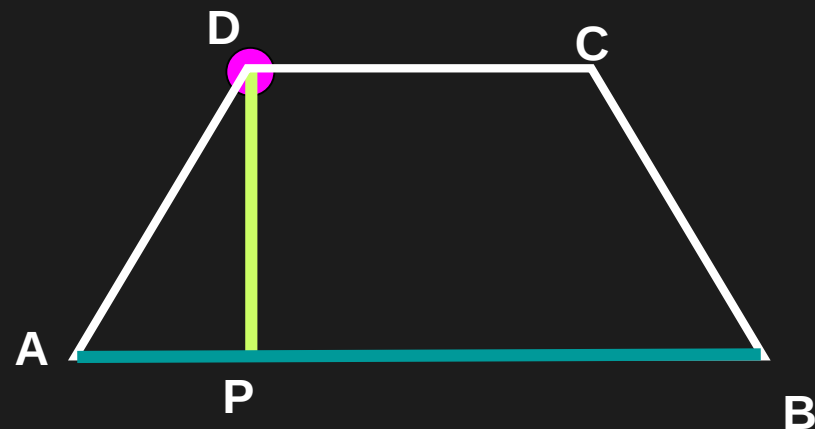
$$T3 \perp$$

$$MP \perp AC$$

$$MP = d(M, AC)$$



$d [M, AB]$

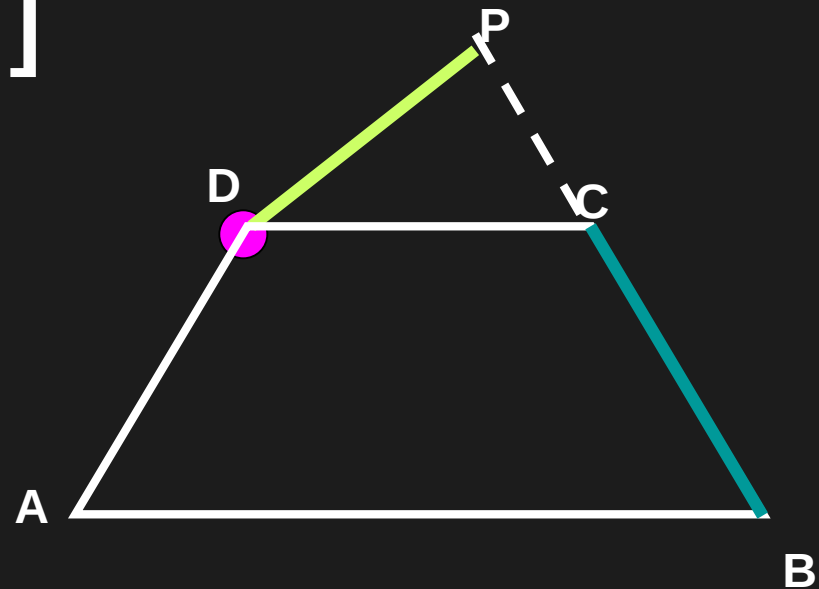
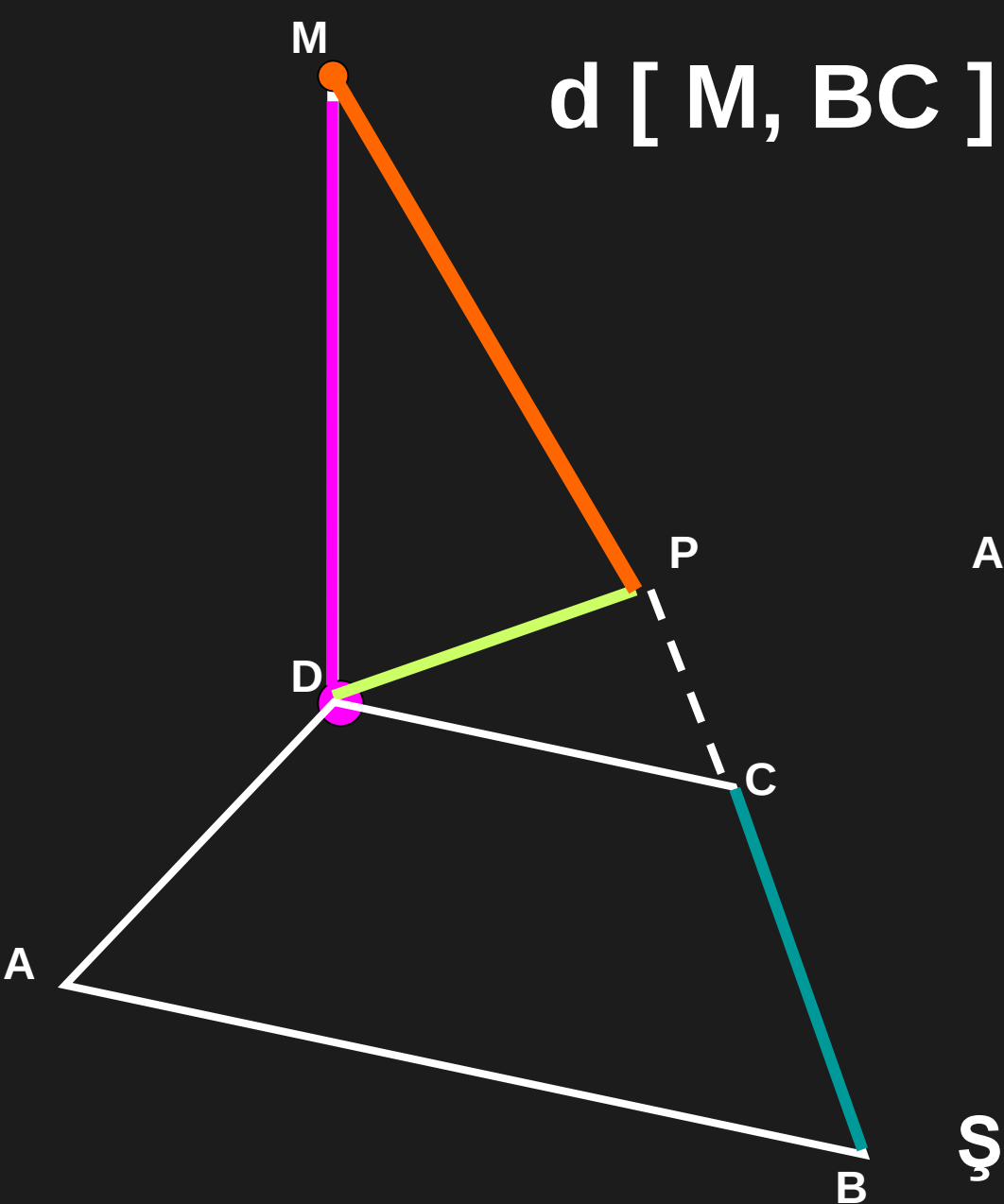


Din picior... **D**

Perpendicular pe ... **AB**

Adică ... **DP**

Și deci ... **MP**



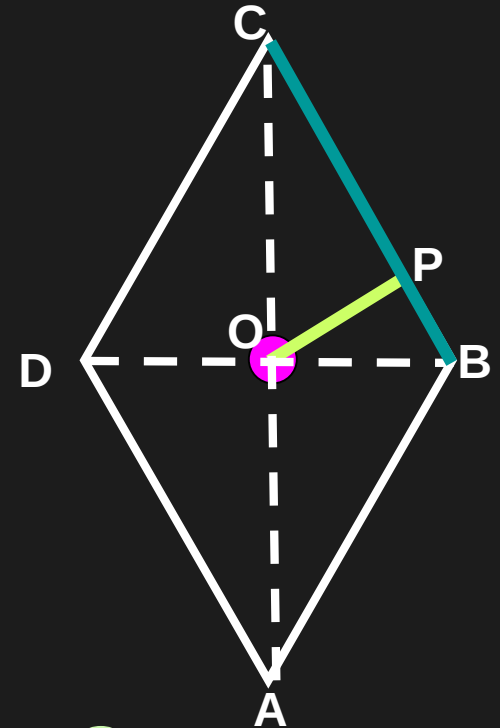
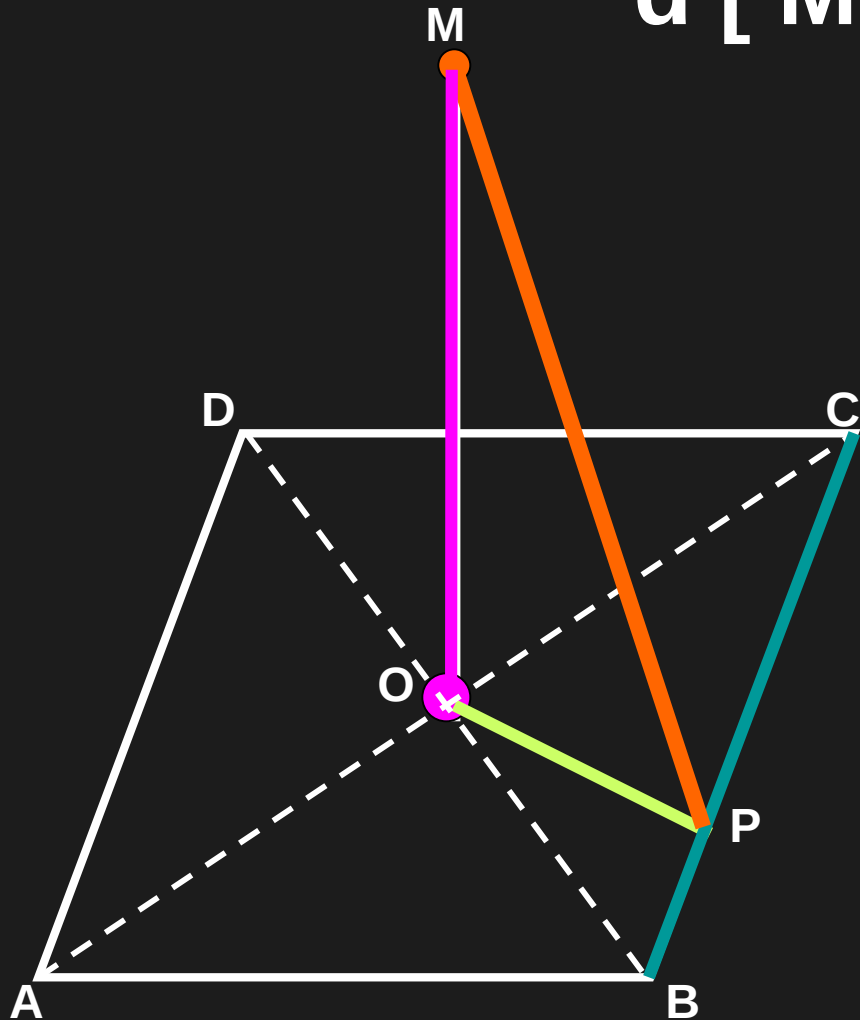
Din picior... **D**

Perpendicular pe ... **BC**

Adică ... **DP**

Și deci ... **MP**

$d[M, BC]$

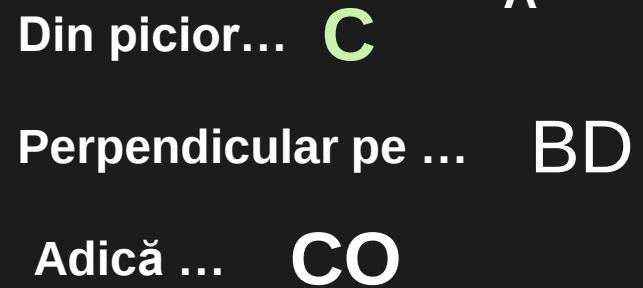


Din picior... **O**

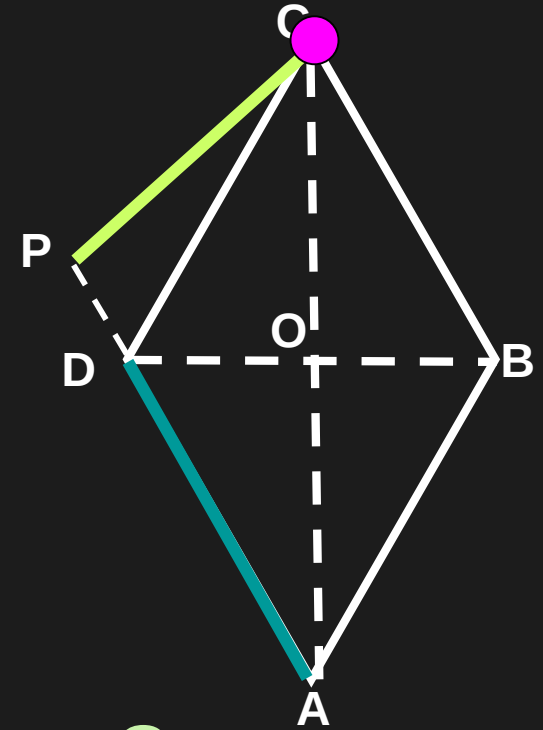
Perpendicular pe ... **BC**

Adică ... **OP**

Și deci ... **MP**

[illegible]

Şi deci ... MO



Din picior... C

Perpendicular pe ... AD

Adică ... CP

Şi deci ... MP