

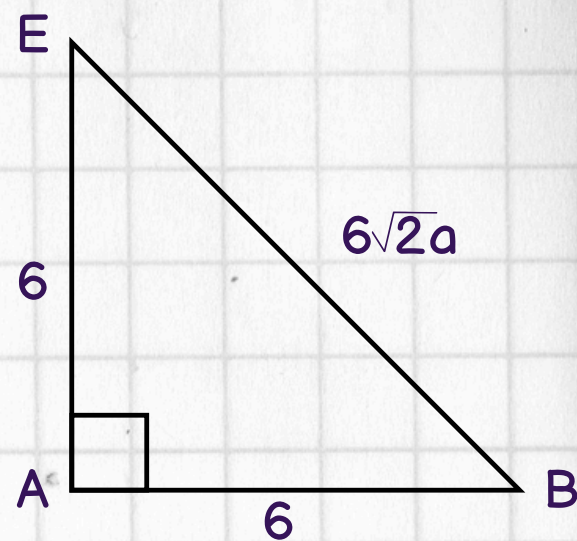
XII MIPA 5

Pembahasan Latihan Soal **Dimensi Tiga**

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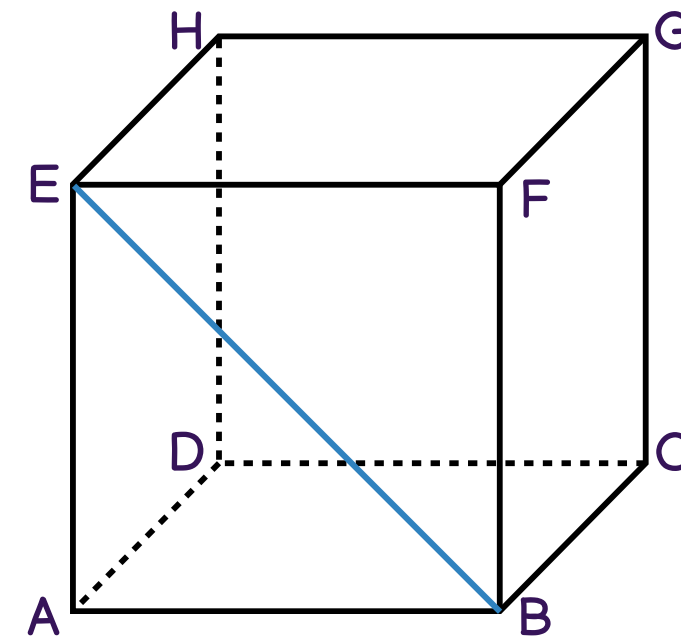
Jarak Titik ke Titik

Diketahui kubus ABCD.EFGH dengan panjang rusuk 6 cm. Tentukan jarak dari titik B ke titik E!



$$\begin{aligned} BE^2 &= BA^2 + AE^2 \\ &= 6^2 + 6^2 \\ &= 72a^2 \\ BE &= 6\sqrt{2}a \text{ cm} \end{aligned}$$

Jarak Titik B menuju E



PEMBUKTIAN

Ketegaklurusan 2 Garis

Buktikan bahwa garis BR_4 tegak lurus dengan garis DG !

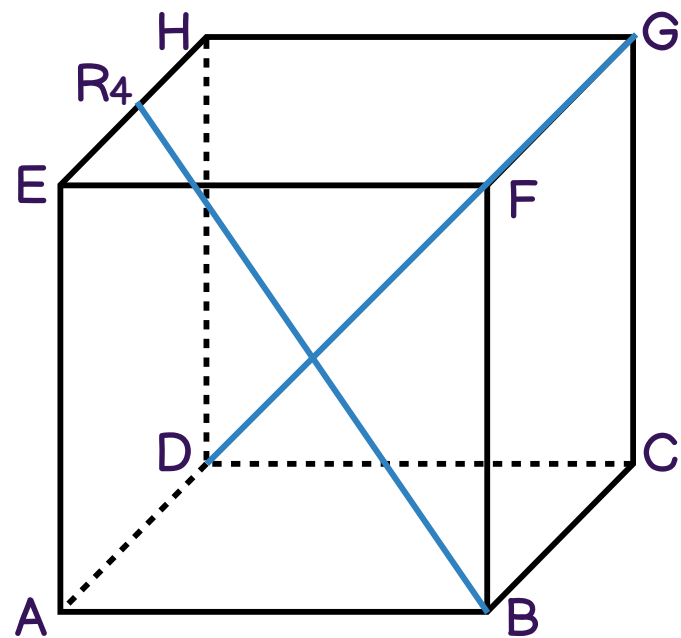
$DG \perp CH$
 $DG \perp BC$ } berpotongan di C

$DG \perp$ bidang $BCHE$

$DG \perp$ semua garis pada $BCHE$

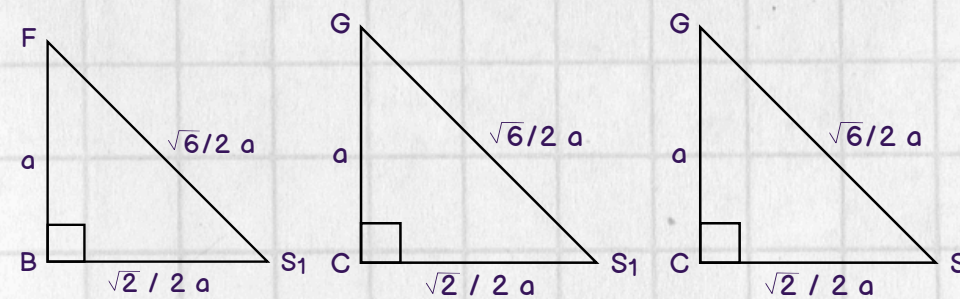
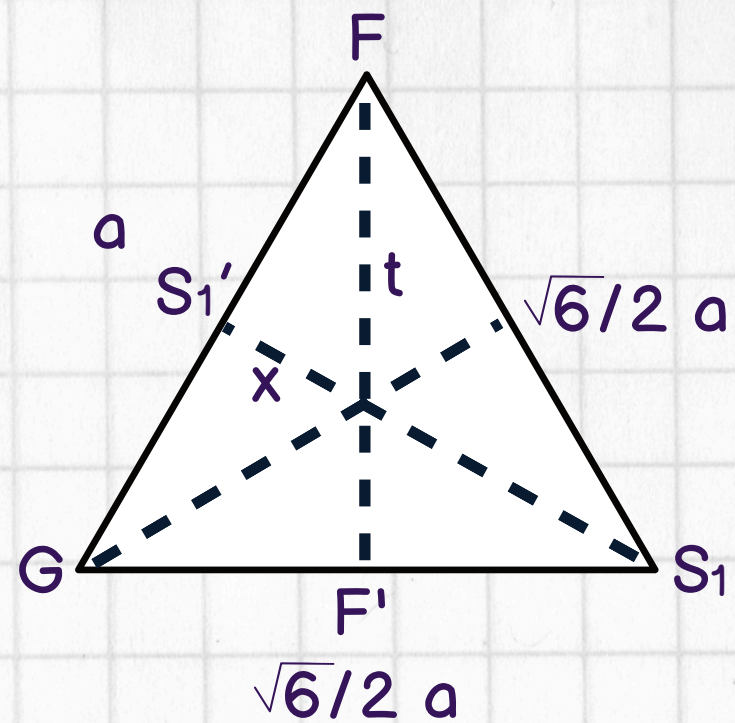
Maka, $DG \perp BR_4$

$BR_4 \perp DG$



Jarak Titik ke Garis

Diketahui kubus ABCD.EFGH dengan panjang rusuk a cm. Tentukan jarak titik F menuju garis GS_1



$$\begin{aligned} x &= \sqrt{(\sqrt{6}/2 a)^2 - (1/2 a)^2} \\ &= \sqrt{6/4 a^2 - 1/4 a^2} \\ &= \sqrt{5}/2 a \end{aligned}$$

$$L_{\triangle} = L_{\triangle}$$

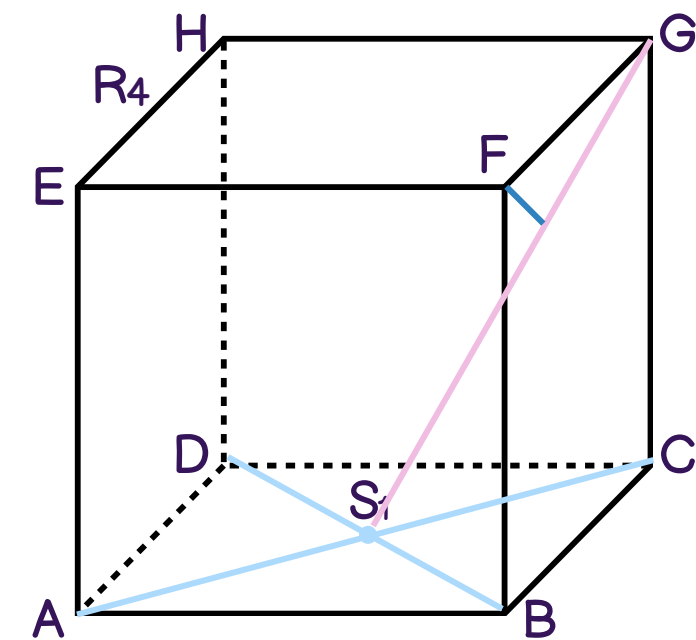
$$1/2 \times FG \times S_1 S_1' = 1/2 \times GS_1 \times FF'$$

$$a \times \sqrt{5}/2 a = \sqrt{6}/2 a \times t$$

$$t = a\sqrt{5}/\sqrt{6}$$

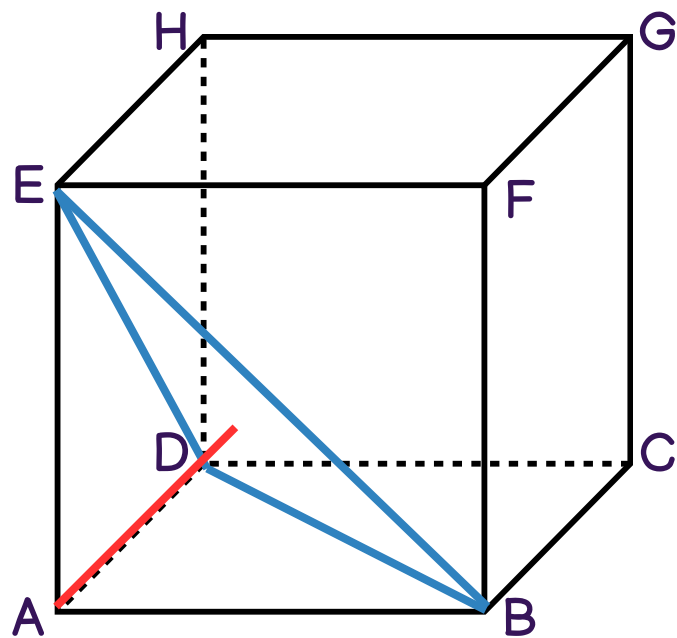
$$t = \sqrt{30}/6 a \text{ cm}$$

Jarak Titik F ke Garis GS_1



Jarak Titik ke Bidang

Titik A ke bidang BDE



Diketahui kubus ABCD.EFGH dengan panjang rusuk 6 cm. Tentukan jarak titik A ke bidang BDE.

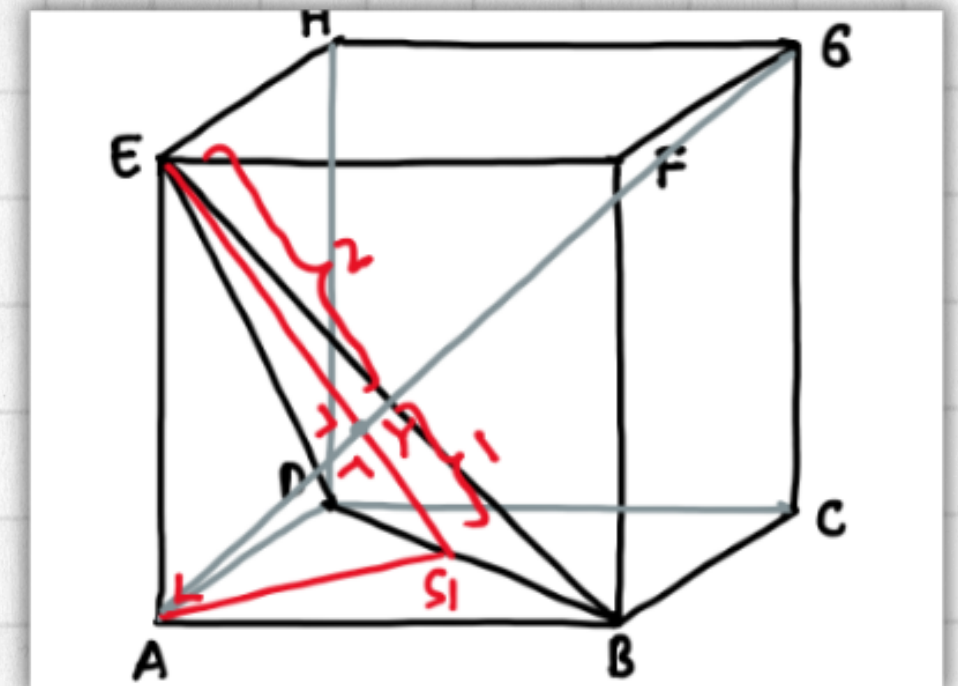
$$\begin{aligned} \textcircled{1} ES_1^2 &= AE^2 + ES_1^2 \\ &= 6^2 + (3\sqrt{2})^2 \\ &= 36 + 18 \\ &= 54 \end{aligned}$$

$$ES_1 = \sqrt{54} = 3\sqrt{6} \text{ cm}$$

$$\begin{aligned} \textcircled{2} YS_1 &= \frac{1}{3} ES_1 \\ &= \frac{1}{3} \times 3\sqrt{6} \\ &= \sqrt{6} \text{ cm} \end{aligned}$$

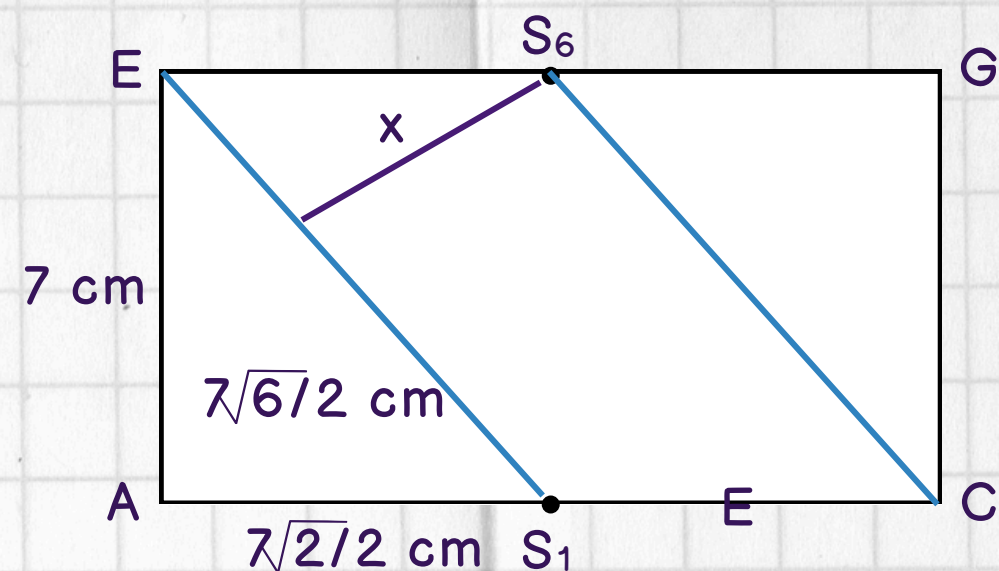
$$\begin{aligned} \textcircled{3} AY^2 &= AS_1^2 - YS_1^2 \\ &= (3\sqrt{2})^2 - (\sqrt{6})^2 \\ &= 18 - 6 \\ &= 12 \end{aligned}$$

$$AY = 2\sqrt{3} \text{ cm}$$



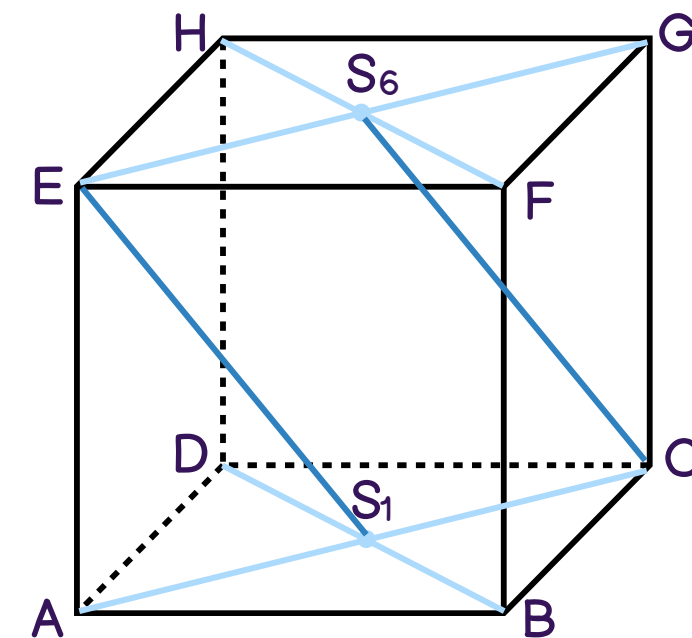
Jarak 2 Garis Sejajar

Diketahui kubus ABCD.EFGH dengan panjang rusuk 7 cm. Tentukan jarak dari garis ES_1 ke CS_6

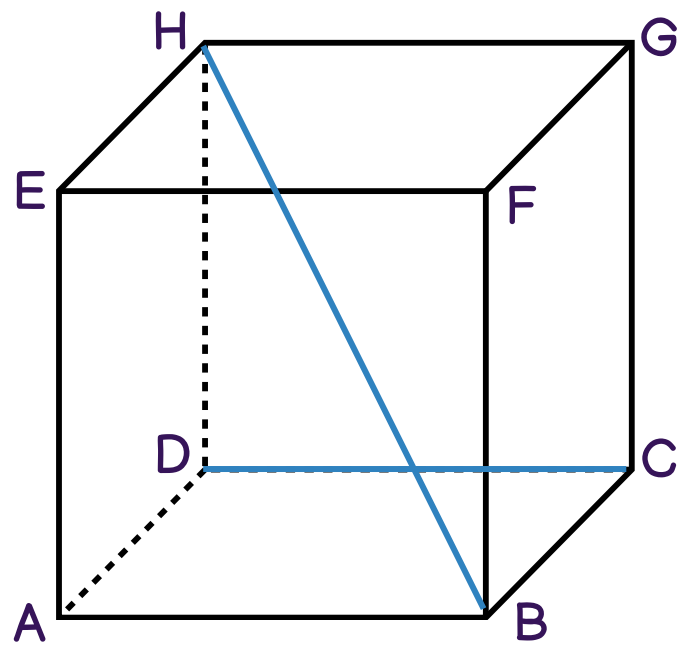


$$\begin{aligned} \frac{1}{2} \times EA \times AS_1 &= \frac{1}{2} \times ES_1 \times x \\ \frac{1}{2} \times 7 \times \frac{7\sqrt{2}}{2} &= \frac{1}{2} \times \frac{7\sqrt{6}}{2} \times x \\ x &= \frac{7\sqrt{3}}{3} \text{ cm} \end{aligned}$$

Jarak Titik ES_1 ke CS_6



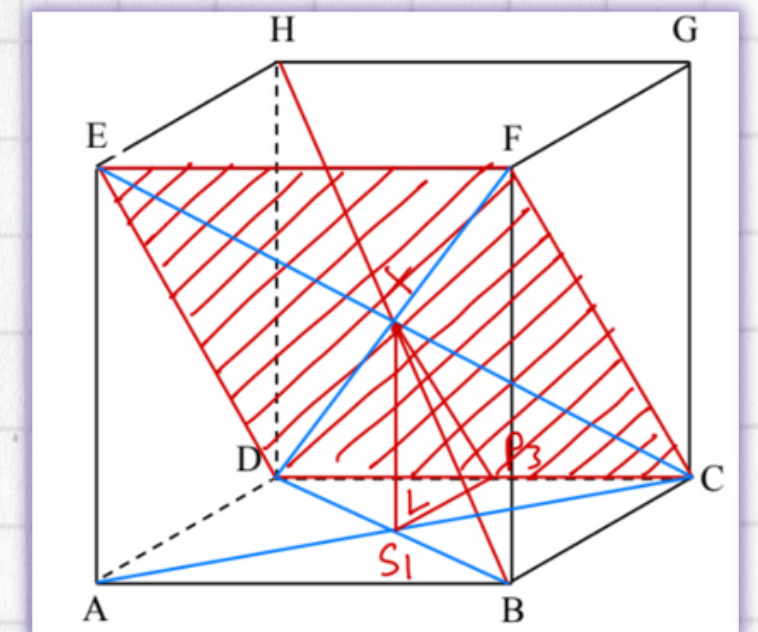
Jarak Garis CD dan BH



Jarak 2 Garis Bersilangan

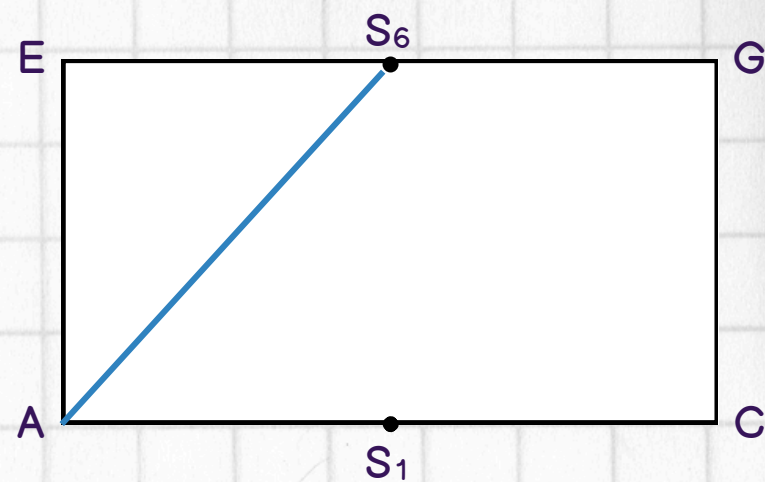
Diketahui kubus ABCD.EFGH dengan panjang rusuk a cm. Tentukan jarak dari garis CD menuju BH.

$$\begin{aligned}XP_3^2 &= XS_1^2 + P_3S_1^2 \\&= (1/2a)^2 + (1/2a)^2 \\&= 1/4 a^2 + 1/4 a^2 \\&= 1/2 a^2 \\XP_3 &= \sqrt{1/2 a^2} \\&= \sqrt{2}/2 a \text{ cm}\end{aligned}$$



Proyeksi Garis ke Garis

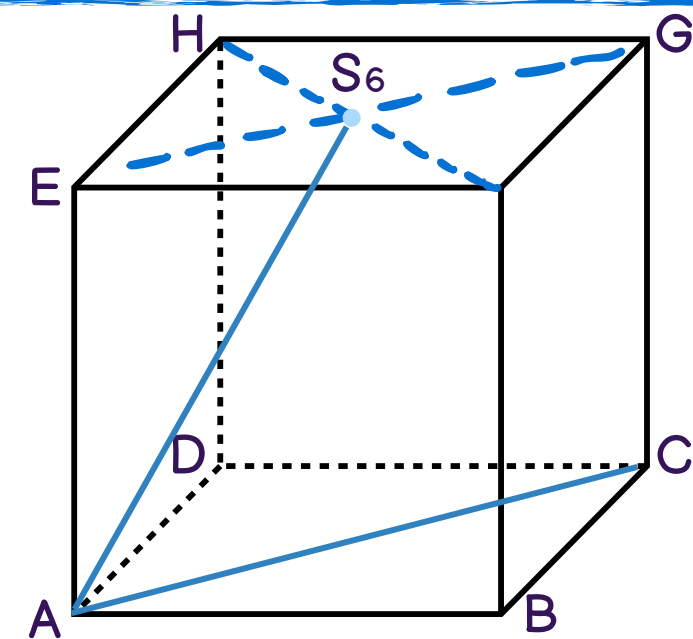
Diketahui kubus ABCD.EFGH dengan panjang rusuk a cm. Tentukan panjang proyeksi garis AS_6 dan pada garis AC



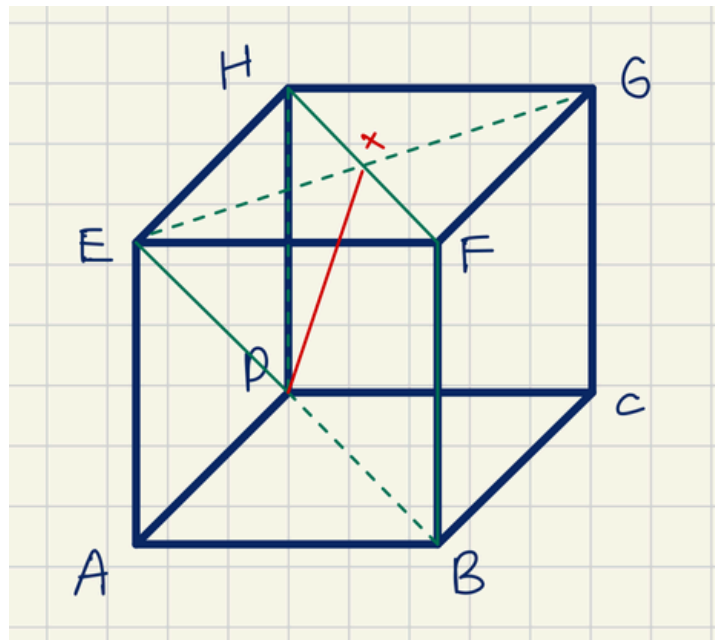
Proyeksi: AS_1

Panjang Proyeksi: $\frac{\sqrt{2}}{2} a$ cm

Proyeksi AS_6 pada AC



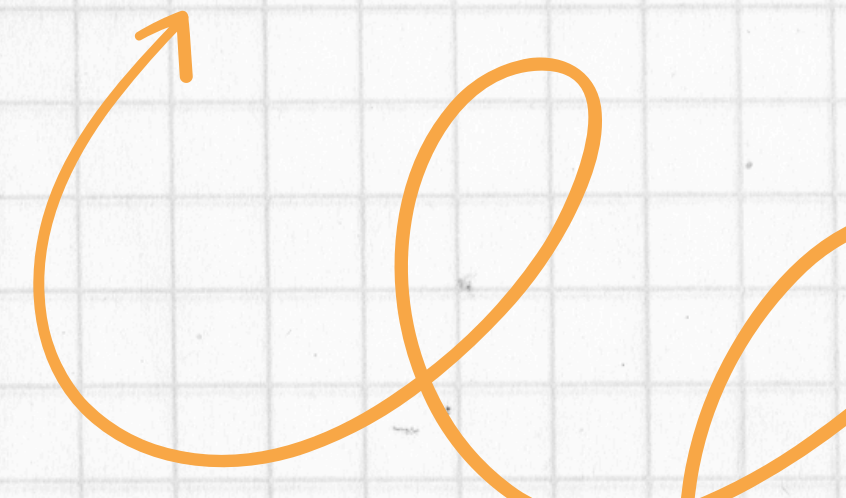
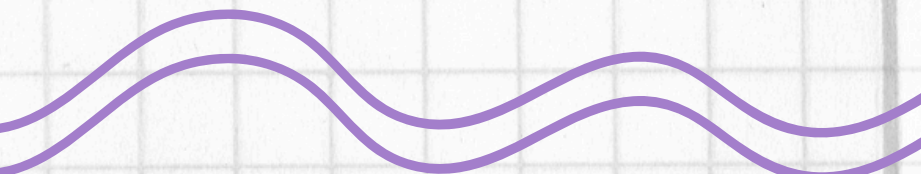
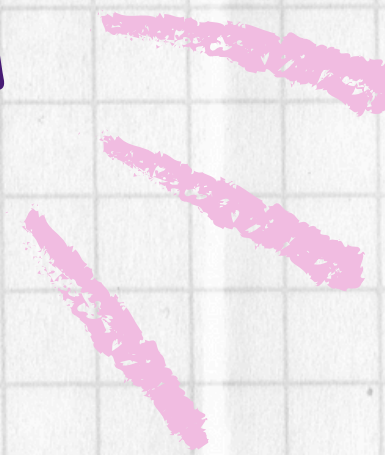
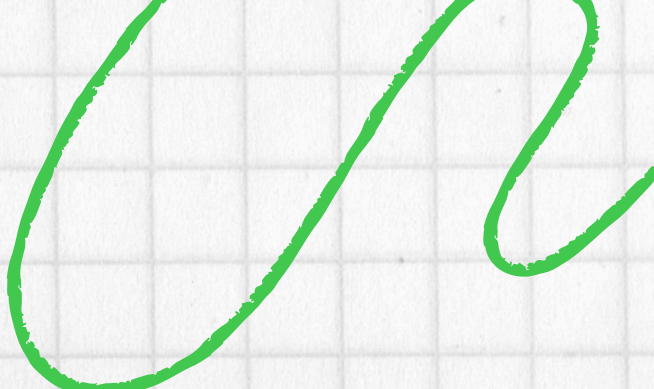
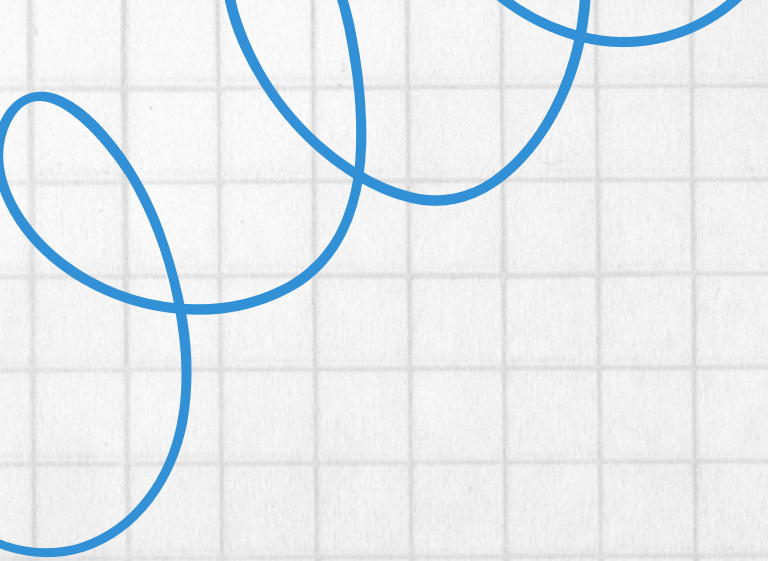
Proyeksi DE pada BDHF



Proyeksi Garis ke Bidang

Diketahui kubus ABCD.EFGH dengan panjang rusuk 8 cm. Tentukan panjang proyeksi DE pada BDHF

$$\begin{aligned} DX &= \text{proyeksi DE pada BDHF} \\ &= \frac{1}{2} \times 8\sqrt{6} \\ &= 4\sqrt{6} \text{ cm} \end{aligned}$$



Thank You