Проведем BD_1 и AE. Тогда $AE_1 = BD_1$ и $AE_1 \parallel BD_1$

$\Rightarrow (BD_1; AF_1) = (AF_1; AE_1) = \angle F_1AE_1$

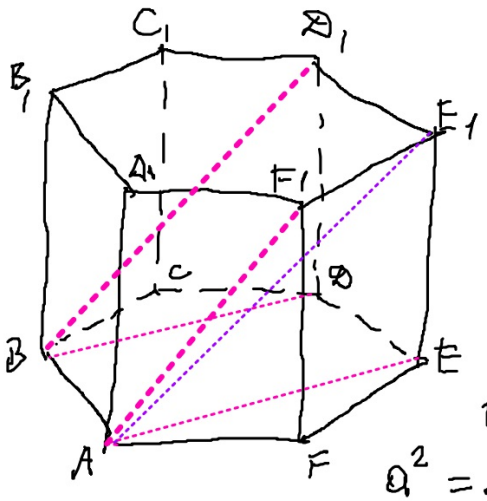
Пусть ребро призмы равно a

Тогда $AF_1^2 = a^2 + a^2 = 2a^2$

$EE_1^2 = a^2$ $\quad AE_1^2 = AE^2 + EE_1^2$

$AE^2 = 3a^2$ (диагональ правильного 6-и угольника)

$\Rightarrow AE_1^2 = 4a^2$



$\Rightarrow$ В $\triangle AF_1E_1$ по т. косинусов:

$F_1E_1^2 = AF_1^2 + AE_1^2 - 2 \cdot AF_1 \cdot AE_1 \cdot \cos \angle F_1AE_1$

$a^2 = 2a^2 + 4a^2 - 2 \cdot 2a \cdot \sqrt{2} \cdot a \cdot \cos \angle F_1AE_1$

$5a^2 = 4\sqrt{2} \cdot a^2 \cdot \cos \angle F_1AE_1 \Rightarrow \cos \angle F_1AE_1 = \frac{5}{4\sqrt{2}} = \frac{5\sqrt{2}}{8}$