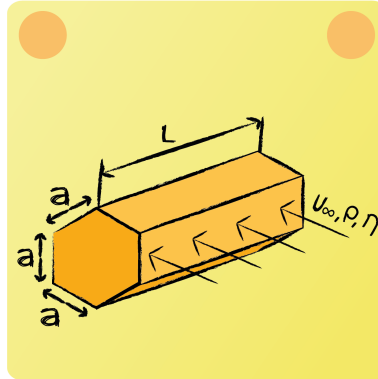


Lecture 6 Question 2.5

Give an expression for the Reynolds number Re , for transverse flow around a hexagon.



Characteristic diameter can be defined as:

$$d = a + 2 \cdot b \quad (4)$$

From trigonometry it yields that:

$$\begin{aligned} \cos(60^\circ) &= \frac{b}{a} \\ \Rightarrow b &= \frac{1}{2} \sqrt{3} a \end{aligned}$$

And thus:

$$\Rightarrow d = a(1 + \sqrt{3})$$

The characteristic length in this case is $d = \sqrt{3}a$, thus:

$$Re_d = \frac{u_\infty \cdot \rho \cdot d}{\eta} = \frac{u_\infty \cdot \rho \cdot a(1 + \sqrt{3})}{\eta}$$