5.2. In Example 5.1, an expression for the aspect ratio of a delta wing was developed in terms of the leading-edge sweep angle ($\Lambda_{LE}$). For this problem, develop an expression for the aspect ratio in terms of the sweep angle of the quarter chord ($\Lambda_{QC}$).

$$\tan (\Delta_{QC}) = \frac{\frac{3}{2}Cr}{b} = \frac{6}{4} \frac{c}{b}$$

Solving for $Cr$

$$Cr = \frac{2}{3} b \tan (\Delta_{QC})$$

Also, $s = \frac{bc}{2}$

So, $s = \frac{b}{2} \frac{2}{3} b \tan (\Delta_{QC}) = \frac{1}{3} b^2 \tan (\Delta_{QC})$

and,

$$AR = \frac{b^2}{s}$$

$$AR = \frac{b^2}{\frac{1}{3} b^2 \tan (\Delta_{QC})}$$

$$AR = \frac{3}{\tan (\Delta_{QC})}$$

$$AR = \frac{3}{\tan (\Delta_{QC})}$$