Q1) Construct, by using the compass and the straightedge only, the point of the real line corresponding to the rational number $\frac{5}{8} \in [0,1]$ and explain the way you did the construction.

Q2) Consider a triangle $ABC$ and $D, E, F$ three points on the sides $BC, CA, AB$ respectively such that $|BD| = x^4|DC|$, $|EA| = (x + 6)|CE|$, $|FB| = x^2|AF|$ for some real number $x$. Find all the values of $x$ such that the cevians $AD, BE, CF$ are concurrent.

Q3) Show that the area of the triangle $ABC$ is given by the formula $(ABC) = \frac{abc}{4R}$ where $R$ is the circumradius.
\[
\frac{3x^2}{x+6} = 4 \quad \Rightarrow \quad 3x^2 = x+6.
\]
\[
3x^2 - x - 6 = 0.
\]
\[
x_{1,2} = \frac{1 \pm \sqrt{1^2 - 4(3)(-6)}}{2(3)}
\]
\[
= \frac{1 \pm \sqrt{73}}{6}.
\]

83) \( (ABC) = \frac{c \cdot h_1}{2} \quad \text{10} \) \quad \sin B = \frac{h_1}{a}
\[
h_1 = a \sin B.
\]
\[
= \frac{c \cdot a \sin B}{2} \quad \text{10}
\]
\[
= \frac{abc}{4R} \quad \text{10}, \text{ by Law of Sines}