Applied Mathematics APM01A1, 2017

February 27, 2017

Tutorial 3

Question 1

Let P and Q be points on line segments $\overline{AB}$ and $\overline{AC}$ such that

$$|\overline{AP}| : |\overline{PB}| = |\overline{AQ}| : |\overline{QC}| = 2 : 3$$

Prove that

$$\overline{PQ} = \frac{2}{5}\overline{BC}.$$

Question 2

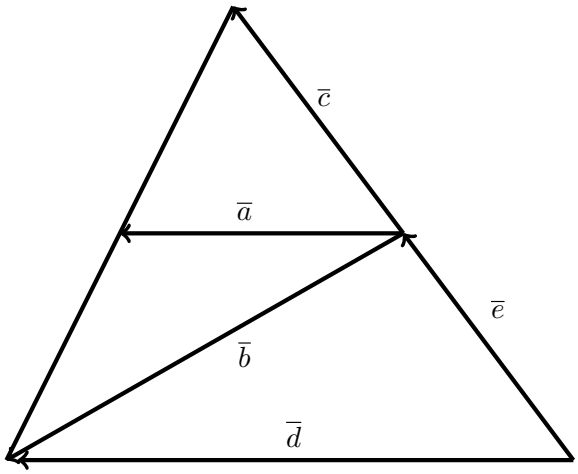
Let B be a point on line segment $\overline{AC}$ such that

$$|\overline{AB}| : |\overline{BC}| = 4 : 3.$$

Let P be any other point on $\overline{AC}$. Find $\overline{PB}$ in terms of $\overline{PA}$ and $\overline{PC}$.

Question 3

In the following figure, $\overline{a}$ is parallel to $\overline{d}$ and $|\overline{c}| : |\overline{e}| = 2 : 3$. Also, let $\overline{f} = \overline{e} + \overline{c}$.



3.a) Use the result of section V.1.6.3 in the notes, and the information above, to write $\overline{a}$ in terms of $\overline{b}$ and $\overline{f}$.

3.b) Write $\overline{d}$ in terms of $\overline{b}$ and $\overline{f}$

3.c) Find k such that

$$\frac{|\overline{a}|}{|\overline{d}|} = k.$$

3.d) What is the actual value of the parameter α?