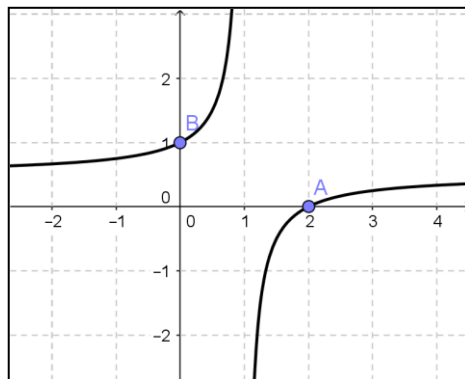


# Problem Solving with GeoGebra

## Construction Problems for Further Pure

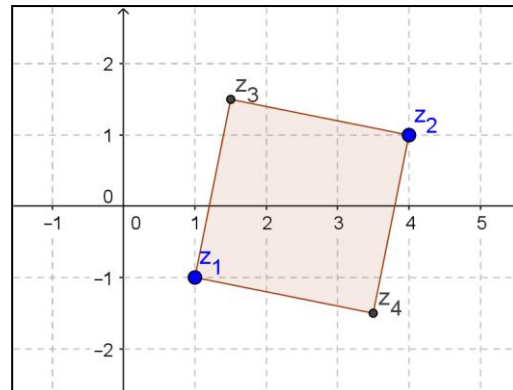
1.



Create a point A fixed to the  $x$ -axis and a point B fixed to the  $y$ -axis.

Construct a rational function that passes through A and B.

2.



Create two complex numbers  $z_1$  and  $z_2$ .

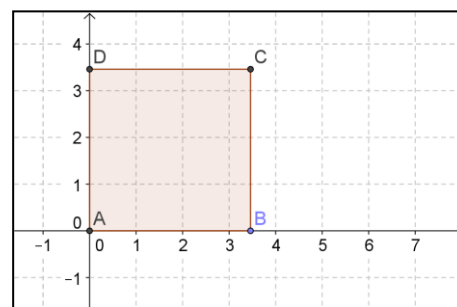
Construct complex numbers  $z_3$  and  $z_4$  such that the 4 points form a square in the Argand diagram with  $z_1$  and  $z_2$  as a diagonal.

3. Add a complex number  $z_1$ .

Construct a cubic with real coefficients such that all it has a zero at  $z_1$  and all three zeros of the cubic lie on the line  $x = \text{Re}(z_1)$ .

You might find the following GeoGebra commands useful:  
 $\text{real}(z_1)$ ,  $\text{imaginary}(z_1)$ ,  
 $\text{ComplexRoot}[f]$

4.



Given a square with variable side (named **poly1**) find a matrix  $M$  such that the command **ApplyMatrix** $[M, \text{poly1}]$  will construct a rectangle with the same area as the square whose sides are in the ratio 2:1.