Exercise 1: (2 points) Factorize the following polynomials and indicate their roots:

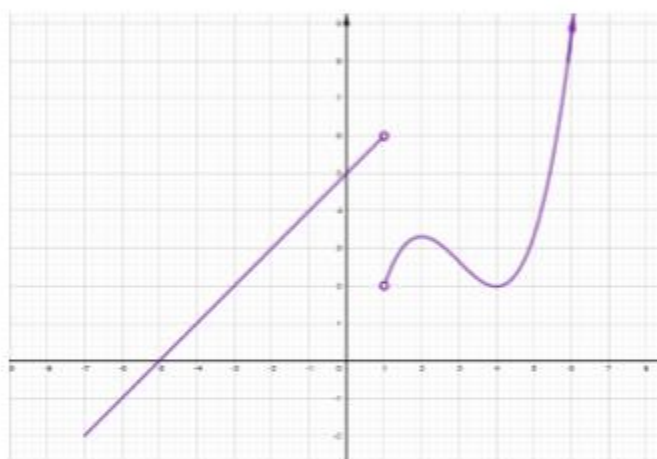$$P(x) = x^4 + x^3 - 5x^2 + 3x$$

$$Q(x) = x^4 + 11x^3 + 43x^2 + 69x + 36$$

Exercise 2: (1.25 points) Find the domain of the following functions:

a) $f(x) = \dfrac{x-1}{x^2 - 5x - 6}$ (0.75)

b) $f(x) = \dfrac{2x-5}{\sqrt{x-7}}$ (0.5)

Exercise 3: (1.75 points) Given the graph of a certain function:

a) Find its domain and its image
b) Indicate the point where the function crosses the axes
c) Study the monotony
d) Study the extrema

Exercise 4: (2 points) Plot graph of the function $f(x) = \begin{cases} 3x+1 & x < 1 \\ x^2 - 4x & 1 \le x < 5 \end{cases}$

Exercise 5: (1 point) Find the axial diagonal of a cuboid if the sides measure 5 cm, 8 cm and 10 cm

Exercise 6: (2 points)

a) **(1)** Find the general equation of the line that goes through the points $A(5,-3)$ and $B(8,6)$

b) **(0.5)** Find a parallel line to $7x - 2y - 8 = 0$ going through the point $P(-1,5)$

c) **(0.5)** Indicate the slope of the straight line $7x - 2y - 8 = 0$ (yup, it's the same one)