

Select **four** exercises out of the five proposed.
ENCIRCLE the selected exercises !!!

1) We consider the function $f(x) = \begin{cases} 2 + x^2 & x \leq 0 \\ 1 - x & 0 < x < 2 \\ (x - 1)^2 & x \geq 2 \end{cases}$.

- (a) Find the points $a \in \mathbb{R}$ where f is **discontinuous**. (Justify)
- (b) Find the points $a \in \mathbb{R}$ where f is discontinuous, but **continuous from the right**. (Justify)

2) Compute $\lim_{x \rightarrow -\infty} (x + \sqrt{x^2 + x})$.

3) Determine the horizontal and the vertical asymptotes of the function $f(x) = \frac{\sqrt{x^6 + 1}}{x^3 - 4x + 3}$.

4) Find the equation of the tangent line to the curve $y = \sqrt{x} + \frac{2}{x}$ at the point (1,3).

5) Consider the function f whose graph is given below. Sketch **carefully** the graph of its derivative f' .

