Name : _____ ST'1-**A**– With calculator – 20'

CALCULUS 03.11.2021

1) Fill the „definition“ of the derivative : $f'(x) = \lim$

2) Compute an estimation of the slope of the tangent to the curve $y = \sqrt{2x-1}$ at the point with abscissa 5. Indicate the computations.

3) $(-3x+6)' =$

   $(x^3 - 2x^2)' =$

   $(x^5 + 7x^3 - x + 4)' =$

4) Give the equation of the slant asymptotes of $f(x) = \sqrt{4x^2 - 18x + 8}$

5) Give the equation of the asymptotes of $f(x) = x + 2 - \sqrt{x^2 + 6}$

6) Determine with justifications:

$$\lim_{x\to 0} \frac{x^2 + x}{\sin^2(2x)} =$$

$$\lim_{x\to 0} \frac{\sin(x)}{x^2 + 1} =$$

$$\lim_{x\to -1} \frac{\sqrt{3-x} - 2}{5x + 5} =$$

Extra questions that do not count for the mark…

Indicate the derivative of $f(x) = x^2 + x$ and use it to give the exact slope of the tangent of the graph of f at the point with abscissa 3.

Give the derivative of $(x) = x^3 - 12x$.
Use it to find the coordinates of **one** "vertex" of that curve f.