

With formulaire

/ 31 pts

Name: _____

Exercise 1. [/ 6 pts]

- a) Use differentials to estimate $\sqrt{79}$, clearly justifying your computations and illustrate.
- b) Compute $\lim_{x \rightarrow 2} \frac{\log(3-x)}{x^2-4}$. Clearly justify your answer.

Exercise 2. [/ 6 pts]

- 1) Determine f such that $F(x) = \sin^2(x)$ is an antiderivative of f . How many solutions are there ?
- 2) Compute $\int_0^4 e^{-2x} dx$
- 3) Determine $\int \sin(3x) + 2 dx$

Exercise 3. [/ 5 pts]

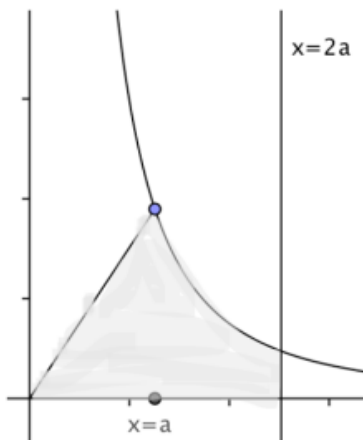
Determine the value of $k \in \mathbb{R}$ such that the functions $f(x) = \sqrt{x}$ and $g(x) = kx^3$ have the same average value on the interval $[1; 4]$.

What's the value of that average ?

Exercise 4. [/ 6 pts]

The graph of the function $f(x) = \frac{3}{x^2}$ is represented.

Determine the value of $a \in \mathbb{R}$ such that the colored area is equal to 5.



Exercise 5. [/ 8 pts]

- a) The colored area A is overestimated by A_5^+ .

Draw the rectangles that are needed to determine that overestimation.

Just beautifully draw, don't compute anything.

- b) **Compute** V_2^- the underestimation of V the volume of revolution obtained by rotating A around the x -axis. The function is $f(x) = x^3 - 2x^2 + 3$.

