

أوجد نهاية التابع  $f$  عند  $a$  :

|                                                  |                                               |
|--------------------------------------------------|-----------------------------------------------|
| $f(x) = \frac{x-1}{x^2-4x+3}, a=1$               | $f(x) = \frac{x^2-3x-2}{x-1}, a=1$            |
| $f(x) = \frac{\sqrt{x+1}-1}{x^2-x}, a=0$         | $f(x) = \frac{\sqrt{x}-1}{x-1}, a=1$          |
| $f(x) = \frac{2-\sqrt{x+2}}{3-\sqrt{2x+5}}, a=2$ | $f(x) = \frac{\sqrt{4-x}-\sqrt{4+x}}{x}, a=0$ |

|                                                                      |                                                         |
|----------------------------------------------------------------------|---------------------------------------------------------|
| $f(x) = \sqrt{5x+1}-x, a=+\infty$                                    | $f(x) = \frac{x^2-9}{\sqrt{x}-\sqrt{3}}, a=3, +\infty$  |
| $f(x) = \frac{\sqrt{x^2+1}-\sqrt{2}}{x-1}, a=1$                      | $f(x) = \sqrt{x^2+x+1}-x, a=-\infty$                    |
| $f(x) = \frac{\sqrt{x^2+1}-x}{\sqrt{x^2-1}-\sqrt{x^2-2}}, a=+\infty$ | $f(x) = x \left( \sqrt{4+\frac{1}{x}}-2 \right), a=0^+$ |

|                                                                 |                                                                      |
|-----------------------------------------------------------------|----------------------------------------------------------------------|
| $f(x) = \sqrt{2x^2-1}-3x, a=+\infty$                            | $f(x) = \frac{3x^2-3}{x-1}, a=1$                                     |
| $f(x) = \sqrt{x^2-1}-x, a=+\infty$                              | $f(x) = \sqrt{3x^2+2x+2}-\sqrt{3x+1}, a=+\infty$                     |
| $f(x) = \sqrt{9x^2+2x-1}-2x+1, a=+\infty$                       | $f(x) = \frac{\sqrt{x^2+3}}{2x}, a=-\infty$                          |
| $f(x) = \frac{x}{\sqrt{x+1}} - \frac{x}{\sqrt{x+2}}, a=+\infty$ | $f(x) = \frac{x\sqrt{x}-2\sqrt{2}}{\sqrt{x}-\sqrt{2}}, a=2, +\infty$ |
| $f(x) = \frac{\sqrt{x+1}-3}{16-2x}, a=8$                        | $f(x) = x^2 \left( \sqrt{2+\frac{1}{x}}-\sqrt{2} \right), a=+\infty$ |

|                                                            |                                                   |
|------------------------------------------------------------|---------------------------------------------------|
| $f(x) = \frac{x^2 - x}{\sin x}, a = 0$                     | $f(x) = \sin x \sqrt{1 + \frac{1}{x^2}}, a = 0^+$ |
| $f(x) = \frac{\sin(\pi\sqrt{1-x})}{x}, a = 0$              | $f(x) = \frac{\sin(2x)}{3x}, a = 0$               |
| $f(x) = \frac{\sin x}{\sqrt{x^2 + x}}, a = 0$              | $f(x) = \frac{\sin(\pi x)}{\sin(2x)}, a = 0$      |
| $f(x) = \frac{\sqrt{x^2 + 4} - 2}{x \cdot \sin 3x}, a = 0$ | $f(x) = \frac{2x^2 + \sin x}{x}, a = 0$           |

**التعريف الثاني:**

ليكن لدينا التابع  $f$  المعرفة على  $] - 5, +\infty[$  وفق:

$$f(x) = \frac{2x + 1}{x + 5}$$

احسب  $\lim_{x \rightarrow +\infty} f(x)$  واستنتج

$$\lim_{x \rightarrow +\infty} f(f(x))$$

جد عدداً حقيقياً يحقق الشرط: إذا كان  $x > A$  كان  $f(x)$  من المجال  $]1.99, 2.01[$