

Test numéro 4 – 45mn

Exercice 1 – relier les graphes et les tableaux de variations correspondants.

The image shows four pairs of graphs and variation tables, labeled A, B, C, and D. Each pair consists of a coordinate system with a curve and a corresponding variation table.

- A:** The graph shows a curve with a vertical asymptote at $x=0$, a local minimum in the fourth quadrant, and a local maximum in the first quadrant. The variation table shows f' is negative for $x < 0$ and positive for $x > 0$. The function f has a vertical asymptote at $x=0$ with $f \rightarrow -\infty$ as $x \rightarrow 0^-$ and $f \rightarrow +\infty$ as $x \rightarrow 0^+$.
- B:** The graph shows a bell-shaped curve symmetric about the y-axis, with a maximum at $(0, 1)$ and horizontal asymptotes at $y = 1$ and $y = -1$. The variation table shows f' is negative for $x < 0$ and positive for $x > 0$. The function f has horizontal asymptotes at $y = 1$ and $y = -1$.
- C:** The graph shows a curve with a vertical asymptote at $x=0$ and a horizontal asymptote at $y=1$. The curve approaches $y=1$ as $x \rightarrow -\infty$ and $y = -\infty$ as $x \rightarrow 0^+$. The variation table shows f' is positive for $x < 0$ and negative for $x > 0$. The function f has a horizontal asymptote at $y=1$ and a vertical asymptote at $x=0$ with $f \rightarrow -1$ as $x \rightarrow 0^+$.
- D:** The graph shows a curve with a vertical asymptote at $x=0$ and a horizontal asymptote at $y=1$. The curve approaches $y=1$ as $x \rightarrow +\infty$ and $y = -\infty$ as $x \rightarrow 0^+$. The variation table shows f' is positive for $x < 0$ and negative for $x > 0$. The function f has a horizontal asymptote at $y=1$ and a vertical asymptote at $x=0$ with $f \rightarrow -1$ as $x \rightarrow 0^+$.

Exercice 2 – Faire l'étude des deux fonctions suivantes :

$$f(x) = xe^{-x^2/2}, \quad g(x) = \ln(x) - 2\sqrt{x}.$$

Exercice 3 – Déterminer les asymptotes de la fonction suivante :

$$h(x) = \frac{2x^2 - 1}{x + 3}$$