

e) $f(x) = 2x - 3 - \sqrt{4x^2 + 6x}$

1) ED: $4x^2 + 6x > 0$

$$2x(2x+3) > 0$$

x	$-\frac{3}{2}$	0
$2x(2x+3)$	+	-

$$ED = \left] -\infty; -\frac{3}{2} \right] \cup [0; +\infty[$$

2) Signe de $f(x)$

zéro de $f(x)$: $2x - 3 - \sqrt{4x^2 + 6x} = 0$

$$2x - 3 = \sqrt{4x^2 + 6x} \quad | (\)^2 \quad !$$

$$4x^2 - 12x + 9 = 4x^2 + 6x$$

$$-18x = -9$$

$$x = \frac{1}{2} \text{ ne convient pas}$$

Preuve: $1 - 3 = \sqrt{1 + 3}$

$$-2 = 2$$

x	$-\frac{3}{2}$	0
$f(x)$	-	-

$$f(0) = -3$$

$$f\left(-\frac{3}{2}\right) = -6$$

$$f\left(-\frac{3}{2}\right) = -3 - 3 = -6$$

3) Recherche des AV Aucune

4) Recherche de AH/AO

à gauche:

$$\bullet \lim_{x \rightarrow -\infty} \left(2x - 3 - \sqrt{4x^2 + 6x} \right) = -\infty - \infty = -\infty \text{ pas de AHG}$$

$$\bullet \boxed{m} = \lim_{x \rightarrow -\infty} \frac{2x - 3 - \sqrt{4x^2 + 6x}}{x} = \lim_{x \rightarrow -\infty} \frac{2x - 3 - \sqrt{4x^2(1 + \frac{6x}{4x^2})}}{x}$$

$$= \lim_{x \rightarrow -\infty} \frac{2x - 3 - |2x| \sqrt{1 + \frac{3}{2x}}}{x} = \underset{|2x| = -2x}{\lim_{x \rightarrow 0}} \frac{2x - 3 + 2x \sqrt{1 + \frac{3}{2x}}}{x}$$

$$= \lim_{x \rightarrow -\infty} \frac{2x \left(1 - \frac{3}{2x} + \sqrt{1 + \frac{3}{2x}} \right)}{x} = \frac{2 \cdot (1 + 1)}{1} = \boxed{4}$$

$$h = \lim_{x \rightarrow -\infty} \left(2x - 3 - \sqrt{4x^2 + 6x} - 4x \right)$$

$$= \lim_{x \rightarrow -\infty} \frac{(-2x - 3) - \sqrt{4x^2 + 6x}}{-2x - 3 + \sqrt{4x^2 + 6x}}$$

$$= \lim_{x \rightarrow -\infty} \frac{(-2x - 3)^2 - (4x^2 + 6x)}{-2x - 3 + |2x| \sqrt{1 + \frac{3}{2x}}}$$

$$= \lim_{x \rightarrow -\infty} \frac{4x^2 + 12x + 9 - 4x^2 - 6x}{-2x - 3 - 2x \sqrt{1 + \frac{3}{2x}}} =$$

$$\underset{|2x| = -2x}{x < 0}$$

$$= \lim_{x \rightarrow -\infty} \frac{6x + 9}{-2x \left(1 + \frac{3}{2x} + \sqrt{1 + \frac{3}{2x}} \right)} = \lim_{x \rightarrow -\infty} \frac{x \left(6 + \frac{9}{x} \right)}{-2x \left(1 + \frac{3}{2x} + \sqrt{1 + \frac{3}{2x}} \right)}$$

$$= \frac{6}{-2 \cdot (1 + 0 + 1)} = -\frac{6}{4} = -\frac{3}{2}$$

$$\boxed{\text{AOG : } y = 4x - \frac{3}{2}}$$

à droite :

$$\lim_{x \rightarrow +\infty} \left(2x - 3 - \sqrt{4x^2 + 6x} \right) \stackrel{F1}{=} +\infty - \infty$$

$$\lim_{x \rightarrow +\infty} \frac{(2x - 3 - \sqrt{4x^2 + 6x})(2x - 3 + \sqrt{4x^2 + 6x})}{2x - 3 + \sqrt{4x^2 + 6x}} =$$

$$\lim_{x \rightarrow +\infty} \frac{4x^2 - 12x + 9 - (4x^2 + 6x)}{2x - 3 + |2x| \sqrt{1 + \frac{3}{2x}}} =$$

$x > 0$
 $|2x| = 2x$

$$\lim_{x \rightarrow +\infty} \frac{-18x + 9}{2x \left(1 - \frac{3}{2x} + \sqrt{1 + \frac{3}{2x}} \right)} = \lim_{x \rightarrow +\infty} \frac{x \left(-18 + \frac{9}{x} \right)}{2x \left(1 - \frac{3}{2x} + \sqrt{1 + \frac{3}{2x}} \right)}$$

$$= \frac{-18}{2 \cdot (1 + 1)} = \frac{-18}{4} = \frac{-9}{2}$$

AHD : $y = -\frac{9}{2}$