Entrainement TSTI2D :

Contenu

n°1

12×8	$\lim\limits_{\substack{x \to 0 \\ x<0}} \left(-\frac{12}{10x^8}\right)$
$-\cos(x-\pi)$	$H\begin{pmatrix}8\\3\end{pmatrix} et\ A\begin{pmatrix}9\\10\end{pmatrix}$ $\left\|\overrightarrow{AH}\right\|$
$P(x) = 9x - 3x^2$ $\sqrt{\Delta} = 9$ $racines$	$z = 4\cos\left(-\frac{3\pi}{4}\right) + 4i\sin\left(-\frac{3\pi}{4}\right)$ $z =$
$z = -1 + i$ $\|z\| =$	$\begin{cases} u_0 = -3 \\ u_{n+1} = u_n + 5 \end{cases}$ $u_{11} =$
$f(x) = \left(\frac{10}{x} - 2x^6\right)\left(\frac{-10}{x^{10}} + 7\sin x\right)$ $f'(x) =$	$f(x) = \sin^4(1-8x)$ $f'(x) =$

n°2

$15^2 - 5^2$	$\lim\limits_{x \to -\infty} \left(-\dfrac{2}{x^7}\right)$
$-\cos(-x)$	$C(-8\,;\,-2) et\ E(-18\,;\,-6)$ $\overrightarrow{EC}$
$P(x) = -20x - 5x^2$ $\sqrt{\Delta} = 20$ $racines$	$(-3 + 9i)(10i + 8)$
$z = 8 - 4i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = 3u_n \end{cases}$ $terme\ général$
$f(x) = \left(\dfrac{-3}{x^9} + 5x^7\right)\left(-4x^{10} + \dfrac{1}{x^6}\right)$ $f'(x) =$	$f(x) = \left(\dfrac{2}{x^3} + 3x^5 + 9x^8\right)^7$ $f'(x) =$

n°3

24×16	$\lim\limits_{x \to +\infty} \left(\frac{3}{10x^2}\right)$
$-\sin\left(\frac{\pi}{2} + x\right)$	$\vec{u}(-10\ ;\ -7)\ et\ \vec{v}(9\ ;\ -10)$ $\vec{u} \cdot \vec{v}$
$P(x) = 4x + 4x^2$ $\sqrt{\Delta} = 4$ $racines$	$\lvert z \rvert = 1\ ; \arg(z) = \frac{\pi}{3}$ $z =$
$z = -\sqrt{2} + \sqrt{2}\, i$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = 4 \\ u_{n+1} = u_n + 8 \end{cases}$ $u_2 =$
$f(x) = -5x^4 - 2x^6 + 6\sqrt{x}$ $f'(x) =$	$f(x) = \sin(7 + 9x)$ $f'(x) =$

n°4

$\left(+\frac{18}{18}\right) \times \left(-\frac{3}{36}\right)$	$\lim\limits_{x \to +\infty} \left(-\frac{11}{x^8}\right)$
$\sin\left(\frac{\pi}{2} + x\right)$	$\vec{u}\begin{pmatrix} 0 \\ -2 \end{pmatrix}$ *et* $\vec{v}\begin{pmatrix} -6 \\ -9 \end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 3x^2 - 7x$ $\Delta =$	$(-7 - 9i)(-7 + 6i)$
$z = -3 + 5i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -7 \\ u_{n+1} = u_n + 9 \end{cases}$ *terme général*
$f(x) = -10x^3 + 9x^6 + \frac{1}{x^8}$ $f'(x) =$	$f(x) = \sin^6(-9x - 5)$ $f'(x) =$

n°5

55×45	$\lim\limits_{x \to -\infty} \left(\dfrac{11}{5x^{10}}\right)$
$-\sin(x + \pi)$	$\vec{u}(5\ ;\ -7)\ et\ \vec{v}(4\ ;\ 9)$ $\vec{u} \cdot \vec{v}$
$P(x) = -5x^2\ - 25x$ $\sqrt{\Delta} = 25$ $racines$	$\lvert z \rvert = 8\ ; \arg(z) = 0$ $z =$
$z = -\sqrt{2}\ i - \sqrt{2}$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -4 \\ u_{n+1} = u_n + 3 \end{cases}$ $u_4 =$
$f(x) = -4x^6 + \dfrac{9}{x^3} + \dfrac{10}{x^4}$ $f'(x) =$	$f(x) = \cos^{10}(4x + 6)$ $f'(x) =$

n°6

$45^2 - 55^2$	$\lim\limits_{x \to -\infty} \left(-\frac{7}{8x^3}\right)$
$-\sin(\pi + x)$	$\vec{u}\begin{pmatrix}1\\-8\end{pmatrix}$ et $\vec{v}\begin{pmatrix}-2\\-10\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = x^2 + 5 + 2x$ $\Delta =$	$-39 + 4i - 49 - 16i$
$z = 8 - 3i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = u_n + 3 \end{cases}$ $u_{11} =$
$f(x) = \frac{-10}{x^5} - 4x^4 + 4x$ $f'(x) =$	$f(x) = \left(-x^5 - 7x^{10} - \frac{6}{x^{10}}\right)^9$ $f'(x) =$

n°7

$\frac{8}{3}-\frac{9}{4}$	$\lim\limits_{\substack{x\to 0\\ x>0}}\left(\frac{9}{11x^9}\right)$
$-\sin(-x)$	$H(-24\,;\,8) et\ C(-21\,;\,0)$ $\overrightarrow{CH}$
$P(x)=60+3x^2-27x$ $\sqrt{\Delta}=3$ $racines$	$z=4\cos\frac{3\pi}{6}+4i\sin\frac{3\pi}{6}$ $z=$
$z=\sqrt{2}\,i+\sqrt{2}$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=3\\ u_{n+1}=u_n+3\end{cases}$ $terme\ général$
$f(x)=\sin(-2x+7)$ $f'(x)=$	$f(x)=\cos^{10}(-x-5)$ $f'(x)=$

n°8

18^2	$\lim\limits_{x \to -\infty} (10x^7 + 7x^5 + 9x^4 + 9x^3)$
$\sin(-x)$	$D(3\,;\,8) et\ E(-1\,;\,1)$ $\|\|\overrightarrow{DE}\|\|$
$P(x) = -3x^2 - 2 + 9x$ $\Delta =$	$\|z\| = 6\,; \arg(z) = -\frac{\pi}{4}$ $z =$
$z = 2 + 2i$ $\|z\| =$	$\begin{cases} u_0 = -2 \\ u_{n+1} = u_n - 8 \end{cases}$ $u_{11} =$
$f(x) = \frac{7x^7 + 7x^8}{-5\cos x}$ $f'(x) =$	$f(x) = \sin^2(-4x - 1)$ $f'(x) =$

n°9

19×21	$\lim\limits_{x \to +\infty} \left(\frac{2}{x^5}\right)$
$\cos(\pi - x)$	$H\begin{pmatrix}-10\\8\end{pmatrix} et\ D\begin{pmatrix}10\\4\end{pmatrix}$ $\left\|\overrightarrow{HD}\right\|$
$P(x) = 2x + 8 - x^2$ $\sqrt{\Delta} = 6$ $racines$	$(3i + 5)(3i - 5)$
$z = 4 + 8i$ $\|z\| =$	$\begin{cases} u_0 = 4 \\ u_{n+1} = u_n + 2 \end{cases}$ $u_{17} =$
$f(x) = \frac{-5x^8 + 9\sin x}{-2\cos x}$ $f'(x) =$	$f(x) = \left(-\frac{7}{x^4} + \frac{10}{x^6} + 6\right)^6$ $f'(x) =$

n°10

21×19	$\lim\limits_{x \to -\infty} (4x^6 + 9x^4 - 8x^3 + 12x^2)$
$\sin(-x)$	$F(19\,;\,-1) et\ C(-9\,;\,21)$ $\overrightarrow{FC}$
$P(x) = 3x^2 + 36 - 21x$ $\sqrt{\Delta} = 3$ $racines$	$(7i + 11)(7i - 11)$
$z = -2 - 7i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -10 \\ u_{n+1} = u_n - 10 \end{cases}$ $u_6 =$
$f(x) = \dfrac{-4x^{10}}{2x^6 - 5x^5}$ $f'(x) =$	$f(x) = \left(-\dfrac{2}{x} + \dfrac{2}{x^2} - 2x^{10}\right)^6$ $f'(x) =$

n°11

$28^2 - 32^2$	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(-\frac{9}{10x^{10}}\right)$
$\cos\left(x - \frac{\pi}{2}\right)$	$B(2\,;\,25) et\ A(-1\,;\,-19)$ $\overrightarrow{AB}$
$P(x) = 4x^2 - 8x$ $\sqrt{\Delta} = 8$ $racines$	$z = 6\cos\pi + 6i\sin\pi$ $z =$
$z = -\sqrt{2} + \sqrt{2}\,i$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases} u_0 = -3 \\ u_{n+1} = u_n + 8 \end{cases}$ $terme\ général$
$f(x) = \frac{-9x^4}{-x^3 + \sin x}$ $f'(x) =$	$f(x) = \sin^4(-5x + 9)$ $f'(x) =$

n°12

24^2	$\lim\limits_{x\to+\infty}(-5x^4 - 10x^3 + 10x - 5)$
$\cos\left(x - \frac{\pi}{2}\right)$	$A(-6\,;\,-9) et\ B(6\,;\,19)$ $\overrightarrow{BA}$
$P(x) = -x^2 + 2 - x$ $\sqrt{\Delta} = 3$ $racines$	$z = 4\cos\left(-\frac{\pi}{2}\right) + 4i\sin\left(-\frac{\pi}{2}\right)$ $z =$
$z = \sqrt{2}\,i - \sqrt{2}$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases} u_0 = -8 \\ u_{n+1} = u_n + 10 \end{cases}$ $terme\ général$
$f(x) = 2\sin(7x + 6)$ $f'(x) =$	$f(x) = \sin^4(-8 + 10x)$ $f'(x) =$

n°13

$\left(-\frac{25}{10}\right) \times \left(-\frac{10}{20}\right)$	$\lim\limits_{x \to +1} \left(\frac{-9x^2 + 12x + 3}{2x^2 + x + 11}\right)$
$\sin(x + \pi)$	$\vec{u}(8\ ;\ 10)\ et\ \vec{v}(8\ ;\ -6)$ $\vec{u} \cdot \vec{v}$
$P(x) = 7x - 5 - x^2$ $\Delta =$	$z = \cos\left(-\frac{3\pi}{6}\right) + i \sin\left(-\frac{3\pi}{6}\right)$ $z =$
$z = -\sqrt{2}\, i + \sqrt{2}$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = 8 \\ u_{n+1} = -8u_n \end{cases}$ $u_3 =$
$f(x) = -10 \sin(-5x + 1)$ $f'(x) =$	$f(x) = (2x^4 - 6x^6)^6$ $f'(x) =$

n°14

$9^2 - 11^2$	$\lim\limits_{x \to -\infty} (-5x^3 + 9x^2 - 11x)$
$\sin(\pi - x)$	$G\begin{pmatrix}-14\\-19\end{pmatrix} et\ D\begin{pmatrix}-10\\6\end{pmatrix}$ $\overrightarrow{DG}$
$P(x) = x^2 + 5 - 4x$ $\Delta =$	$27i - 4i - 11 - 36$
$z = \sqrt{3} + i$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -1 \\ u_{n+1} = 9u_n \end{cases}$ *terme général*
$f(x) = -6\sin x + 4x^6 - 2x^5$ $f'(x) =$	$f(x) = \left(\frac{8}{x^4} - 10 - 6x\right)^8$ $f'(x) =$

n°15

$\left(+\frac{10}{24}\right) \times \left(-\frac{16}{12}\right)$	$\lim\limits_{\substack{x \to 0 \\ x<0}} \left(\frac{11}{7x^9}\right)$
$-\sin\left(x + \frac{\pi}{2}\right)$	$B(1\,;\,-9) et\ A(7\,;\,-4)$ $\left\|\overrightarrow{AB}\right\|$
$P(x) = x^2 - 9x + 2$ $\Delta =$	$z = 5\cos\left(-\frac{\pi}{2}\right) + 5i\sin\left(-\frac{\pi}{2}\right)$ $z =$
$z = -\sqrt{2} + \sqrt{2}\,i$ $\|z\|\,;\arg(z)$	$\begin{cases} u_0 = 2 \\ u_{n+1} = u_n + 1 \end{cases}$ *terme général*
$f(x) = 7\cos(-3x - 10)$ $f'(x) =$	$f(x) = \sin^6(-10x + 9)$ $f'(x) =$

n°16

$\left(+\frac{16}{24}\right) \times \left(-\frac{24}{20}\right)$	$\lim\limits_{x \to +\infty} \left(\frac{12}{x^8}\right)$
$\sin\left(x - \frac{\pi}{2}\right)$	$A\begin{pmatrix}-9\\18\end{pmatrix} et\ C\begin{pmatrix}-5\\-1\end{pmatrix}$ $\overrightarrow{AC}$
$P(x) = x + 4 - 3x^2$ $\Delta =$	$-48i - 30 - 4i + 31$
$z = -\sqrt{3}\, i - 1$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -6 \\ u_{n+1} = -5u_n \end{cases}$ *terme général*
$f(x) = \left(\frac{9}{x^4} - 2x^2\right)\left(\frac{4}{x^9} + \frac{3}{x^3}\right)$ $f'(x) =$	$f(x) = \cos(x + 6)$ $f'(x) =$

n°17

25^2	$\lim\limits_{\substack{x\to 0\\ x>0}} \left(-\frac{3}{x^2}\right)$
$-\sin\left(x-\frac{\pi}{2}\right)$	$A(-10\,;\,-1) et\ F(5\,;\,-10)$ $\left\|\left\|\overrightarrow{AF}\right\|\right\|$
$P(x)=3x^2+12x+12$ $\sqrt{\Delta}=0$ $racines$	$(-3i+1)(5+i)$
$z=-2-10i$ $\|z\|=$	$\begin{cases} u_0=-7 \\ u_{n+1}=u_n+7 \end{cases}$ $terme\ général$
$f(x)=-4\cos(-3x+6)$ $f'(x)=$	$f(x)=\left(-\frac{7}{x^7}+\frac{3}{x^{10}}+\frac{3}{x^5}\right)^4$ $f'(x)=$

n°18

$\left(-\frac{10}{15}\right)\times\left(-\frac{18}{6}\right)$	$\lim\limits_{x\to-\infty}(x^7-4x^2-7x+7)$
$-\cos\left(\frac{\pi}{2}+x\right)$	$E\begin{pmatrix}2\\-7\end{pmatrix}et\ F\begin{pmatrix}-10\\1\end{pmatrix}$ $\left\|\overrightarrow{EF}\right\|$
$P(x)=x^2\ -15+2x$ $\sqrt{\Delta}=8$ $racines$	$z=\cos\frac{2\pi}{3}+i\sin\frac{2\pi}{3}$ $z=$
$z=1+\sqrt{3}\,i$ $\|z\|\ ;\arg(z)$	$\begin{cases}u_0=-4\\u_{n+1}=-2u_n\end{cases}$ $u_{11}=$
$f(x)=-10\sin(6x+1)$ $f'(x)=$	$f(x)=\sin(5x-1)$ $f'(x)=$

n°19

12^2	$\lim\limits_{x \to -\infty} \left(-\frac{4}{12x^9}\right)$
$\cos(x+\pi)$	$A\begin{pmatrix}0\\21\end{pmatrix} et\ F\begin{pmatrix}14\\3\end{pmatrix}$ $\overrightarrow{AF}$
$P(x) = 6x + 4x^2 + 1$ $\Delta =$	$17i - 29 + 9 - 25i$
$z = -1 - \sqrt{3}\, i$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -10 \\ u_{n+1} = -10u_n \end{cases}$ *terme général*
$f(x) = \frac{-3\cos x}{-10x^5 + 8x^5}$ $f'(x) =$	$f(x) = \left(-x^6 + 2x^5 - \frac{2}{x^5}\right)^2$ $f'(x) =$

n°20

12^2	$\lim\limits_{\substack{x\to 0 \\ x<0}} \frac{1}{x^{10}}$
$\sin\left(x-\frac{\pi}{2}\right)$	$H\begin{pmatrix}-10\\8\end{pmatrix} et\ F\begin{pmatrix}5\\5\end{pmatrix}$ $\|\|\overrightarrow{FH}\|\|$
$P(x)=-1-2x-x^2$ $\sqrt{\Delta}=0$ $racines$	$(10+6i)(10-6i)$
$z=-1+4i$ $\|z\|=$	$\begin{cases}u_0=2\\u_{n+1}=0u_n\end{cases}$ $u_9=$
$f(x)=\cos(8x+8)$ $f'(x)=$	$f(x)=\sin(-1-8x)$ $f'(x)=$

n°21

21^2	$\lim\limits_{x \to -\infty} \left(\frac{5}{2x^{10}}\right)$
$-\sin(-x)$	$\vec{u}\begin{pmatrix}-1\\-2\end{pmatrix}$ et $\vec{v}\begin{pmatrix}9\\-5\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 5x + 3x^2$ $\Delta =$	$(-6i - 9)(1 + 2i)$
$z = 1 + 3i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = u_n - 9 \end{cases}$ $u_5 =$
$f(x) = -\sin(6x - 8)$ $f'(x) =$	$f(x) = \sin^4(-3 + 8x)$ $f'(x) =$

n°22

15^2	$\lim\limits_{x\to+\infty}\left(\dfrac{-8x^2+3x\ +4}{8x^2+5x\ +5}\right)$
$-\sin\left(x-\dfrac{\pi}{2}\right)$	$\vec{u}(8\ ;\ 2)\ et\ \vec{v}(2\ ;\ 2)$ $\vec{u}\cdot\vec{v}$
$P(x)=1-4x+x^2$ $\Delta=$	$(7i-3)(2-2i)$
$z=8+5i$ $\lvert z\rvert=$	$\begin{cases}u_0=-6\\u_{n+1}=10u_n\end{cases}$ $u_6=$
$f(x)=\dfrac{\cos x}{x^6+\dfrac{9}{x^5}}$ $f'(x)=$	$f(x)=\left(-9x^4-9x^4+\dfrac{2}{x}\right)^4$ $f'(x)=$

n°23

21^2	$\lim\limits_{x \to +\infty} (-7x^7 - 12x^6 + 6x - 1)$
$-\cos(\pi + x)$	$\vec{u}\begin{pmatrix} 7 \\ -9 \end{pmatrix}$ et $\vec{v}\begin{pmatrix} -8 \\ 3 \end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 3x^2 - 4 - 5x$ $\Delta =$	$\lvert z \rvert = 6 \,;\, \arg(z) = -\dfrac{3\pi}{4}$ $z =$
$z = -3 - 7i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -3 \\ u_{n+1} = 10u_n \end{cases}$ $u_{16} =$
$f(x) = \dfrac{-10x^6}{-5x^9 + x}$ $f'(x) =$	$f(x) = \left(5x^7 - 8x^4 - \dfrac{2}{x^2}\right)^6$ $f'(x) =$

n°24

19^2	$\lim\limits_{x\to-\infty}\left(-\dfrac{10}{x^9}\right)$
$-\cos\left(\dfrac{\pi}{2}-x\right)$	$H\begin{pmatrix}-5\\5\end{pmatrix}$ *et* $E\begin{pmatrix}1\\-5\end{pmatrix}$ $\left\|\overrightarrow{EH}\right\|$
$P(x)=2x^2+3$ $\Delta=$	$(i+3)(4i+1)$
$z=1-2i$ $\|z\|=$	$\begin{cases}u_0=-9\\u_{n+1}=9u_n\end{cases}$ *terme général*
$f(x)=(10x^{10}+5x^6)\left(\dfrac{-2}{x^7}-2x^3\right)$ $f'(x)=$	$f(x)=\left(-\dfrac{9}{x^2}-\dfrac{6}{x^7}+\dfrac{9}{x^6}\right)^6$ $f'(x)=$

n°25

$\frac{9}{10}+\frac{7}{3}$	$\lim\limits_{x\to-\infty}\left(\frac{8}{6x^3}\right)$
$-\cos(\pi-x)$	$\vec{u}(3\ ;\ -3)\ et\ \vec{v}(-1\ ;\ -5)$ $\vec{u}\cdot\vec{v}$
$P(x)=-x^2\ +3x+4$ $\Delta=$	$(4+10i)(4-10i)$
$z=-4+7i$ $\lvert z\rvert=$	$\begin{cases}u_0=8\\u_{n+1}=u_n-9\end{cases}$ *terme général*
$f(x)=-10\cos(-x+3)$ $f'(x)=$	$f(x)=\sin(-4x-4)$ $f'(x)=$

n°26

$\left(-\frac{6}{12}\right)\times\left(+\frac{12}{5}\right)$	$\lim\limits_{\substack{x\to 0\\ x>0}}\left(\frac{12}{4x^6}\right)$
$-\cos(-x)$	$A\begin{pmatrix}8\\0\end{pmatrix}$ et $B\begin{pmatrix}-1\\10\end{pmatrix}$ $\left\|\overrightarrow{BA}\right\|$
$P(x)=-5x^2+8x+5$ $\Delta=$	$\|z\|=3\,;\arg(z)=\frac{2\pi}{4}$ $z=$
$z=\sqrt{2}+\sqrt{2}\,i$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=-6\\u_{n+1}=7u_n\end{cases}$ $terme\ général$
$f(x)=\frac{8x^8}{4x-x}$ $f'(x)=$	$f(x)=\cos^5(-3-3x)$ $f'(x)=$

n°27

21^2	$\lim\limits_{x\to+\infty}(-2x^{10}+11x^3-5x-6)$
$\cos\left(\frac{\pi}{2}-x\right)$	$\vec{u}\begin{pmatrix}8\\8\end{pmatrix}$ et $\vec{v}\begin{pmatrix}7\\8\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x)=12x-16-2x^2$ $\sqrt{\Delta}=4$ $racines$	$z=4\cos 0+4i\sin 0$ $z=$
$z=-i+\sqrt{3}$ $\lvert z\rvert$; $\arg(z)$	$\begin{cases}u_0=-6\\u_{n+1}=6u_n\end{cases}$ $u_4=$
$f(x)=\dfrac{-10\sin x+10x^3}{-3x^4}$ $f'(x)=$	$f(x)=\left(\dfrac{-\frac{9}{x^6}7}{x^3}\right)^8$ $f'(x)=$

n°28

51×49	$\lim\limits_{x \to -1} \left(\dfrac{-9x\ -10}{9x^2 + 5x\ + 3} \right)$
$-\cos\left(\dfrac{\pi}{2} + x\right)$	$H(-16\ ;\ -15) et\ F(3\ ;\ 10)$ $\overrightarrow{HF}$
$P(x) = 3x^2\ - 1 - 10x$ $\Delta =$	$(-10 + 2i)(-10 + 2i)$
$z = -\sqrt{3}\, i + 1$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -1 \\ u_{n+1} = u_n + 9 \end{cases}$ $u_{18} =$
$f(x) = \dfrac{-2}{x^{10}} - \dfrac{2}{x^{10}} + \dfrac{1}{x^6}$ $f'(x) =$	$f(x) = \left(\dfrac{4}{x^9} - \dfrac{2}{x^5} + \dfrac{10}{x^8} \right)^4$ $f'(x) =$

n°29

$\frac{1}{7}+\frac{8}{5}$	$\lim\limits_{x\to-\infty}\left(\frac{2}{x^8}\right)$
$\sin\left(\frac{\pi}{2}+x\right)$	$E(4\,;\,9) et\ B(4\,;\,5)$ $\left\|\overrightarrow{BE}\right\|$
$P(x)=-5x^2\ -3-5x$ $\Delta=$	$(8i+4)(8i-4)$
$z=1$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=-8\\u_{n+1}=-10u_n\end{cases}$ *terme général*
$f(x)=-7\cos(-6x-3)$ $f'(x)=$	$f(x)=\left(-\frac{9}{x^3}+\frac{10}{x}+4x^5\right)^9$ $f'(x)=$

n°30

16^2	$\lim\limits_{x\to+\infty}\left(-\dfrac{6}{x^5}\right)$
$-\sin\left(x+\dfrac{\pi}{2}\right)$	$H(7\,;\,-5) et\ G(11\,;\,11)$ $\overrightarrow{HG}$
$P(x)=8x+4x^2\ -32$ $\sqrt{\Delta}=24$ $racines$	$(3i+4)(3i-4)$
$z=\sqrt{2}-\sqrt{2}\,i$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=3\\u_{n+1}=-10u_n\end{cases}$ $terme\ général$
$f(x)=\dfrac{-8x^5}{\dfrac{4}{x^{10}}-\dfrac{10}{x^5}}$ $f'(x)=$	$f(x)=\left(-\dfrac{7}{x^4}+\dfrac{4}{x}-9x\right)^2$ $f'(x)=$

n°31

$27^2 - 33^2$	$\lim\limits_{\substack{x \to 0 \\ x<0}} \left(\frac{1}{7x^4}\right)$
$-\cos(-x)$	$C(-19\ ;\ 3) et\ B(2\ ;\ 16)$ $\overrightarrow{CB}$
$P(x) = -1 + x^2$ $\sqrt{\Delta} = 2$ $racines$	$z = 2\cos\frac{\pi}{6} + 2i\sin\frac{\pi}{6}$ $z =$
$z = -\sqrt{3}\,i - 1$ $\lvert z\rvert\ ;\arg(z)$	$\begin{cases} u_0 = -2 \\ u_{n+1} = u_n + 2 \end{cases}$ $u_{20} =$
$f(x) = -7\cos(7x - 8)$ $f'(x) =$	$f(x) = (8x^{10} - 7x^{10} + 3x)^2$ $f'(x) =$

n°32

30^2	$\lim\limits_{x\to-\infty}\left(\dfrac{3x^2-7x}{-7x^2-12x+7}\right)$
$-\cos(x-\pi)$	$F\begin{pmatrix}-19\\3\end{pmatrix} et\ E\begin{pmatrix}-8\\0\end{pmatrix}$ $\overrightarrow{FE}$
$P(x)=3x^2-3x-36$ $\sqrt{\Delta}=21$ $racines$	$(3+i)(-7i-2)$
$z=1-2i$ $\lvert z\rvert=$	$\begin{cases}u_0=1\\u_{n+1}=u_n-9\end{cases}$ $u_{10}=$
$f(x)=\dfrac{-2x^2-9x}{6\cos x}$ $f'(x)=$	$f(x)=\sin^9(-10+2x)$ $f'(x)=$

n°33

19×21	$\lim\limits_{x \to -\infty} \left(\dfrac{11x^2 + 3x + 8}{7x^2 + 7x - 12} \right)$
$\cos\left(\dfrac{\pi}{2} - x\right)$	$C\begin{pmatrix} -15 \\ -18 \end{pmatrix} et\ G\begin{pmatrix} 23 \\ 0 \end{pmatrix}$ $\overrightarrow{GC}$
$P(x) = 3x^2 - 36 - 3x$ $\sqrt{\Delta} = 21$ $racines$	$\lvert z \rvert = 5\ ; \arg(z) = -\dfrac{\pi}{2}$ $z =$
$z = -1 - 5i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 5 \\ u_{n+1} = -6u_n \end{cases}$ $u_4 =$
$f(x) = \dfrac{-4x^3}{\dfrac{4}{x} + \sin x}$ $f'(x) =$	$f(x) = \left(-10x^5 + \dfrac{6}{x^7} - 9x^{10}\right)^5$ $f'(x) =$

n°34

$\left(-\frac{20}{6}\right)\times\left(+\frac{4}{20}\right)$	$\lim\limits_{x\to+\infty}\left(\frac{-11x^2+9x\ +7}{2x^2-11x\ +3}\right)$
$\cos(\pi+x)$	$F(-10\ ;\ -8) et\ C(-6\ ;\ -7)$ $\left\|\overrightarrow{CF}\right\|$
$P(x)=8x+16+x^2$ $\sqrt{\Delta}=0$ $racines$	$-31i+32-41+17i$
$z=-\sqrt{3}+i$ $\|z\|\ ;\arg(z)$	$\begin{cases}u_0=-8\\u_{n+1}=u_n-9\end{cases}$ $terme\ général$
$f(x)=\frac{\frac{-9}{x^2}}{7\cos x+10x^9}$ $f'(x)=$	$f(x)=\cos^8(-3+5x)$ $f'(x)=$

n°35

53×47	$\lim\limits_{x \to -\infty} \left(\dfrac{-x\ -11}{7x^2 - 10x\ -10} \right)$
$-\sin(-x)$	$G(3\ ;\ -9) et\ F(-4\ ;\ 7)$ $\left\| \overrightarrow{FG} \right\|$
$P(x) = -x^2\ + 2x + 3$ $\sqrt{\Delta} = 4$ $racines$	$z = 8\cos\left(-\dfrac{\pi}{2}\right) + 8i\sin\left(-\dfrac{\pi}{2}\right)$ $z =$
$z = -\sqrt{2}\,i + \sqrt{2}$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = 9 \\ u_{n+1} = u_n + 4 \end{cases}$ $terme\ général$
$f(x) = \left(\dfrac{-3}{x^9} + \dfrac{4}{x^{10}}\right)\left(\dfrac{-1}{x^9} + \dfrac{1}{x^8}\right)$ $f'(x) =$	$f(x) = \cos^7(9x + 2)$ $f'(x) =$

n°36

12^2	$\lim\limits_{x\to+\infty}\left(\frac{8}{4x^4}\right)$
$-\cos(-x)$	$H(-10\ ;\ 6) et\ C(1\ ;\ 10)$ $\left\|\overrightarrow{CH}\right\|$
$P(x)=2x^2\ +14x+20$ $\sqrt{\Delta}=6$ $racines$	$(2+2i)(2-2i)$
$z=-6-1i$ $\|z\|=$	$\begin{cases}u_0=-7\\u_{n+1}=u_n-2\end{cases}$ $terme\ général$
$f(x)=-10\cos(x-9)$ $f'(x)=$	$f(x)=(-3x^4-2x^9)^4$ $f'(x)=$

n°37

11^2	$\lim\limits_{\substack{x\to 0\\ x<0}} \left(\frac{10}{12x^{10}}\right)$
$-\cos(-x)$	$A\begin{pmatrix}5\\-1\end{pmatrix} et\ B\begin{pmatrix}-10\\5\end{pmatrix}$ $\left\|\overrightarrow{AB}\right\|$
$P(x) = 2x^2 - 3 - 10x$ $\Delta =$	$(12+6i)^2$
$z = \sqrt{3} + i$ $\|z\|\ ;\arg(z)$	$\begin{cases}u_0 = 9\\u_{n+1} = 7u_n\end{cases}$ $u_{11} =$
$f(x) = \left(-9x^2 - 3\sqrt{x}\right)\left(\frac{-2}{x} - 6x^8\right)$ $f'(x) =$	$f(x) = \left(-2x^3 + 4 - \frac{7}{x^9}\right)^4$ $f'(x) =$

n°38

24^2	$\lim\limits_{x \to +1} (-2x^{10} - 10x^9 - 12x^5 + 4x^4)$
$\cos\left(x - \frac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix}5\\-7\end{pmatrix}$ et $\vec{v}\begin{pmatrix}3\\-10\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -2x - 8 + x^2$ $\sqrt{\Delta} = 6$ $racines$	$-20 + 12i - 47i - 32$
$z = \sqrt{3}\, i - 1$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -4 \\ u_{n+1} = u_n + 8 \end{cases}$ $u_3 =$
$f(x) = \dfrac{-7\cos x + \frac{1}{x^9}}{\cos x}$ $f'(x) =$	$f(x) = \left(-\frac{1}{x} - 9x^4 - \frac{4}{x^6}\right)^3$ $f'(x) =$

n°39

13^2	$\lim\limits_{\substack{x\to 0 \\ x<0}} \frac{-4}{8x}$
$-\cos\left(\frac{\pi}{2}-x\right)$	$\vec{u}\begin{pmatrix}7\\-3\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}1\\3\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x)=-5x^2+40-10x$ $\sqrt{\Delta}=30$ *racines*	$(11+i)^2$
$z=\sqrt{2}+\sqrt{2}\,i$ $\lvert z\rvert$; $\arg(z)$	$\begin{cases}u_0=-6\\u_{n+1}=1u_n\end{cases}$ *terme général*
$f(x)=\frac{1}{x^{10}}+8\sqrt{x}+\frac{9}{x^8}$ $f'(x)=$	$f(x)=\left(-\frac{1}{x^{10}}-\frac{7}{x^6}+10x^4\right)^5$ $f'(x)=$

n°40

$45^2 - 35^2$	$\lim\limits_{x \to +\infty} (-6x^9 + 9x^6 + 2x^4 + 8x^3)$
$\cos\left(x - \frac{\pi}{2}\right)$	$\vec{u}(9\ ;\ 9)\ et\ \vec{v}(-2\ ;\ 3)$ $\vec{u} \cdot \vec{v}$
$P(x) = -10x - 5x^2$ $\sqrt{\Delta} = 10$ $racines$	$(12i + 3)(12i - 3)$
$z = -\sqrt{2} + \sqrt{2}\, i$ $\lvert z \rvert\ ;\arg(z)$	$\begin{cases} u_0 = -4 \\ u_{n+1} = u_n - 3 \end{cases}$ $u_3 =$
$f(x) = 10\cos(-2x - 7)$ $f'(x) =$	$f(x) = (2x^7 - 10x + 7x^9)^6$ $f'(x) =$

n°41

37×43	$\lim\limits_{x \to +\infty} (3x^9 + 2x^3 + 9x^2 + 11)$
$\sin(-x)$	$\vec{u}\begin{pmatrix}1\\-8\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}-7\\0\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 5x^2 - 7x$ $\Delta =$	$z = 4\cos\frac{\pi}{2} + 4i\sin\frac{\pi}{2}$ $z =$
$z = 6 + 2i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -6 \\ u_{n+1} = u_n - 9 \end{cases}$ *terme général*
$f(x) = 5x^2 - 7\sin x - \frac{3}{x^4}$ $f'(x) =$	$f(x) = \left(\frac{2}{x^6} + \frac{10}{x^8} + 7x^5\right)^2$ $f'(x) =$

n°42

34×26	$\lim\limits_{x \to -\infty} (-8x^3 + 12x^2 + 11x - 4)$
$\cos(\pi + x)$	$\vec{u}\begin{pmatrix}-6\\10\end{pmatrix}$ et $\vec{v}\begin{pmatrix}-7\\-8\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 3 - 5x^2 - 8x$ $\Delta =$	$\lvert z \rvert = 1$; $\arg(z) = \frac{\pi}{2}$ $z =$
$z = -7 + i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -10 \\ u_{n+1} = -6u_n \end{cases}$ $u_1 =$
$f(x) = 7x + 4x^6 + \frac{1}{x^2}$ $f'(x) =$	$f(x) = \cos^{10}(-3x - 6)$ $f'(x) =$

n°43

$48^2 - 52^2$	$\lim\limits_{x \to -\infty} \left(\dfrac{2x^2 + 5x + 2}{12x^2 - 11x + 8} \right)$
$-\cos\left(\dfrac{\pi}{2} + x\right)$	$E(6\,;\,-10) et\ H(4\,;\,10)$ $\left\|\overrightarrow{EH}\right\|$
$P(x) = -2x^2 - 24 + 14x$ $\sqrt{\Delta} = 2$ $racines$	$z = 5\cos\dfrac{\pi}{4} + 5i\sin\dfrac{\pi}{4}$ $z =$
$z = -4 + 3i$ $\lvert z\rvert =$	$\begin{cases} u_0 = -8 \\ u_{n+1} = u_n - 10 \end{cases}$ $terme\ général$
$f(x) = \dfrac{-6}{x^9} + 7\cos x + \dfrac{7}{x^8}$ $f'(x) =$	$f(x) = \left(-\dfrac{5}{x^3} + \dfrac{1}{x^9} - 4x\right)^2$ $f'(x) =$

n°44

$31^2 - 29^2$	$\lim\limits_{x \to +\infty} (-3x^7 - 9x^6 - 10x^5 - 2x^2)$
$\sin(x + \pi)$	$G(7\,;\,-4) et\ E(-10\,;\,-7)$ $\left\|\left\|\overrightarrow{EG}\right\|\right\|$
$P(x) = -2x^2$ $\sqrt{\Delta} = 0$ $racines$	$\|z\| = 6\,;\arg(z) = -\dfrac{2\pi}{4}$ $z =$
$z = -2 + 9i$ $\|z\| =$	$\begin{cases} u_0 = 6 \\ u_{n+1} = 4u_n \end{cases}$ $terme\ général$
$f(x) = \dfrac{-10\cos x + 7x}{\cos x}$ $f'(x) =$	$f(x) = \left(\dfrac{3}{x^{10}} - \dfrac{9}{x^7} - \dfrac{1}{x^6}\right)^7$ $f'(x) =$

n°45

11^2	$\lim\limits_{\substack{x\to 0\\ x>0}} \left(\frac{2}{x^8}\right)$
$-\cos\left(x-\frac{\pi}{2}\right)$	$\vec{u}(-10\,;\,-10)\ et\ \vec{v}(-7\,;\,-8)$ $\vec{u}\cdot\vec{v}$
$P(x)=4x^2+10x$ $\Delta=$	$(2+9i)(2-9i)$
$z=-\sqrt{3}\,i+1$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=-4\\ u_{n+1}=8u_n\end{cases}$ $terme\ général$
$f(x)=-7\sqrt{x}-\frac{6}{x^9}+\frac{3}{x^8}$ $f'(x)=$	$f(x)=(-7x^2+9x^7+9x)^9$ $f'(x)=$

n°46

$\left(+\frac{36}{20}\right) \times \left(+\frac{30}{12}\right)$	$\lim\limits_{x \to +\infty} \left(\frac{5x^2 - 7x + 12}{-7x^2 - 6x - 5}\right)$
$-\cos(\pi - x)$	$\vec{u}\begin{pmatrix}5\\1\end{pmatrix}$ et $\vec{v}\begin{pmatrix}-3\\6\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -4x^2 + 16x - 12$ $\sqrt{\Delta} = 8$ $racines$	$(7 + 4i)(i - 4)$
$z = 9 - 3i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = u_n + 1 \end{cases}$ $u_6 =$
$f(x) = -5\sin(-5x - 3)$ $f'(x) =$	$f(x) = (-8 + x^{10} - 9x^3)^4$ $f'(x) =$

n°47

26×34	$\lim\limits_{x \to -\infty} \left(\dfrac{7x^2 - 6x - 1}{11x^2 + 7x - 2} \right)$
$-\cos\left(x - \dfrac{\pi}{2}\right)$	$D\begin{pmatrix} -23 \\ -13 \end{pmatrix} et\ B\begin{pmatrix} -8 \\ 20 \end{pmatrix}$ $\overrightarrow{DB}$
$P(x) = -4x^2 + 4x$ $\sqrt{\Delta} = 4$ $racines$	$(9i + 11)^2$
$z = \sqrt{3} + i$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -4 \\ u_{n+1} = u_n - 6 \end{cases}$ $u_{10} =$
$f(x) = \dfrac{9}{x^6} + \dfrac{8}{x^{10}} + 2x^8$ $f'(x) =$	$f(x) = \left(\dfrac{6}{x^5} - \dfrac{5}{x^{10}} - 2x^8 \right)^6$ $f'(x) =$

n°48

25^2	$\lim\limits_{\substack{x\to 0\\ x<0}} \left(\frac{9}{x^3}\right)$
$\sin(x-\pi)$	$\vec{u}(7\,;\,-10)\ et\ \vec{v}(-10\,;\,-7)$ $\vec{u}\cdot\vec{v}$
$P(x)=2x^2-12x+10$ $\sqrt{\Delta}=8$ $racines$	$-5-23i-22-14i$
$z=4+8i$ $\lvert z\rvert=$	$\begin{cases} u_0=-2 \\ u_{n+1}=u_n+1 \end{cases}$ $u_{19}=$
$f(x)=-3\sin(-2x-3)$ $f'(x)=$	$f(x)=(10x^4+x^5+3)^5$ $f'(x)=$

n°49

$\frac{4}{3}+\frac{5}{6}$	$\lim\limits_{x\to+\infty}(8x^7-10x^6-6x^3+7x)$
$\cos\left(\frac{\pi}{2}-x\right)$	$G\begin{pmatrix}-23\\4\end{pmatrix}$ et $C\begin{pmatrix}3\\-5\end{pmatrix}$ $\overrightarrow{CG}$
$P(x)=3x-2x^2$ $\Delta=$	$(12i+2)^2$
$z=-4+2i$ $\lvert z\rvert=$	$\begin{cases}u_0=-5\\u_{n+1}=u_n+1\end{cases}$ $u_8=$
$f(x)=-10x^3-\frac{2}{x^8}+\frac{3}{x^8}$ $f'(x)=$	$f(x)=\sin^7(9x+8)$ $f'(x)=$

n°50

$\frac{8}{1}-\frac{5}{3}$	$\lim\limits_{x\to+1}\left(\frac{x^2-8x\ -9}{-7x^2+x\ +4}\right)$
$\cos\left(x+\frac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix}1\\10\end{pmatrix}$ et $\vec{v}\begin{pmatrix}5\\8\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x)=-x^2\ -x+12$ $\sqrt{\Delta}=7$ $racines$	$-9i+32+21-19i$
$z=-9-10i$ $\lvert z\rvert=$	$\begin{cases}u_0=-6\\u_{n+1}=u_n+1\end{cases}$ $terme\ général$
$f(x)=\frac{-9}{x^{10}}-9x^{10}+\frac{9}{x^9}$ $f'(x)=$	$f(x)=(-5+8-8x^{10})^7$ $f'(x)=$

n°51

12×8	$\lim\limits_{x \to +\infty} \dfrac{1}{x^9}$
$-\cos\left(x + \dfrac{\pi}{2}\right)$	$F\begin{pmatrix}9\\-8\end{pmatrix}$ et $D\begin{pmatrix}8\\-7\end{pmatrix}$ $\left\|\overrightarrow{FD}\right\|$
$P(x) = -3 - 2x^2 - 4x$ $\Delta =$	$i - 5 - 18 - 2i$
$z = 6 - 9i$ $\|z\| =$	$\begin{cases} u_0 = -5 \\ u_{n+1} = -4u_n \end{cases}$ $terme\ général$
$f(x) = -6\sqrt{x} + \dfrac{7}{x^4} - 3x^5$ $f'(x) =$	$f(x) = \cos^4(-6x + 9)$ $f'(x) =$

n°52

20^2	$\lim\limits_{x\to+\infty}\left(-\dfrac{9}{2x^4}\right)$
$-\cos(\pi+x)$	$E\begin{pmatrix}14\\-2\end{pmatrix}$ et $C\begin{pmatrix}-8\\-10\end{pmatrix}$ $\overrightarrow{EC}$
$P(x)=3x^2\ -4-7x$ $\Delta=$	$(-10i-6)^2$
$z=-\sqrt{2}\,i+\sqrt{2}$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=-8\\u_{n+1}=-7u_n\end{cases}$ $u_8=$
$f(x)=\dfrac{\dfrac{9}{x^2}}{\dfrac{-8}{x^3}-2\cos x}$ $f'(x)=$	$f(x)=\cos^2(8+3x)$ $f'(x)=$

n°53

$\frac{6}{10} - \frac{7}{5}$	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(\frac{3}{x^{10}}\right)$
$-\cos(-x)$	$C(2\,;\,-7) et\ F(6\,;\,-2)$ $\left\|\left\|\overrightarrow{FC}\right\|\right\|$
$P(x) = 2x^2 + 2x - 40$ $\sqrt{\Delta} = 18$ $racines$	$z = \cos\frac{\pi}{2} + i \sin\frac{\pi}{2}$ $z =$
$z = 1 - \sqrt{3}\, i$ $\|z\|\,;\arg(z)$	$\begin{cases} u_0 = -6 \\ u_{n+1} = 2u_n \end{cases}$ $u_{12} =$
$f(x) = \frac{\frac{-4}{x^3}}{x + 6\sin x}$ $f'(x) =$	$f(x) = \left(9 - \frac{9}{x^3} - \frac{6}{x^5}\right)^9$ $f'(x) =$

n°54

$-\frac{10}{8}-\frac{9}{10}$	$\lim\limits_{x\to+\infty}\left(\frac{2}{x^3}\right)$
$-\cos(x-\pi)$	$C(24\,;\,24) et\ D(-24\,;\,-7)$ $\overrightarrow{DC}$
$P(x)=4x+2x^2$ $\Delta=$	$(3+11i)^2$
$z=-9-6i$ $\lvert z\rvert=$	$\begin{cases}u_0=1\\u_{n+1}=u_n-4\end{cases}$ *terme général*
$f(x)=(8x^{10}+x^8)\left(\frac{-5}{x^3}-2x^{10}\right)$ $f'(x)=$	$f(x)=\cos^2(2-x)$ $f'(x)=$

n°55

$\frac{1}{10} - \frac{2}{4}$	$\lim\limits_{x \to -1} (-12x^3 - 12x^2 + x + 11)$
$\sin(-x)$	$F(6\,;\,12) et\ A(-5\,;\,-11)$ $\overrightarrow{AF}$
$P(x) = -5x^2 + 50 - 15x$ $\sqrt{\Delta} = 35$ $racines$	$\lvert z \rvert = 2\,;\arg(z) = \frac{2\pi}{4}$ $z =$
$z = 5 - 1i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 2 \\ u_{n+1} = 0u_n \end{cases}$ $u_{10} =$
$f(x) = \frac{\sin x}{\sin x + \frac{8}{x^8}}$ $f'(x) =$	$f(x) = \left(-\frac{7}{x^7} + \frac{7}{x^6}\right)^9$ $f'(x) =$

n°56

16^2	$\lim\limits_{x\to+\infty}\left(\dfrac{-10x^2-6x\ +1}{-9x^2+6x\ -12}\right)$
$-\cos(\pi+x)$	$\vec{u}\begin{pmatrix}-2\\1\end{pmatrix}$ et $\vec{v}\begin{pmatrix}8\\9\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x)=-27+3x^2$ $\sqrt{\Delta}=18$ $racines$	$(-10i-12)^2$
$z=-2+9i$ $\lvert z\rvert=$	$\begin{cases}u_0=-8\\u_{n+1}=-3u_n\end{cases}$ $u_2=$
$f(x)=\left(\dfrac{10}{x^4}-6x^7\right)(-4x^5-8x^6)$ $f'(x)=$	$f(x)=\cos^3(4-2x)$ $f'(x)=$

n°57

$\left(-\frac{5}{8}\right) \times \left(+\frac{16}{5}\right)$	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(\frac{5}{x^3}\right)$
$\cos\left(\frac{\pi}{2} + x\right)$	$E(-4\,;\,10) et\ G(4\,;\,-3)$ $\left\|\overrightarrow{GE}\right\|$
$P(x) = -1 - x + 5x^2$ $\Delta =$	$z = 3\cos\pi + 3i\sin\pi$ $z =$
$z = \sqrt{3}\,i - 1$ $\|z\|\,;\arg(z)$	$\begin{cases} u_0 = -1 \\ u_{n+1} = u_n + 2 \end{cases}$ *terme général*
$f(x) = 3\sin(7x - 9)$ $f'(x) =$	$f(x) = \left(-x^{10} - \frac{1}{x^2}\right)^7$ $f'(x) =$

n°58

23×17	$\lim\limits_{x \to +1} \left(\dfrac{9x^2 + 6x + 12}{-11x^2 + 3x + 8} \right)$
$-\cos\left(x - \dfrac{\pi}{2}\right)$	$B\begin{pmatrix} 8 \\ 16 \end{pmatrix}$ et $C\begin{pmatrix} 15 \\ -9 \end{pmatrix}$ $\overrightarrow{CB}$
$P(x) = -4x^2 - 3 + 6x$ $\Delta =$	$z = 3\cos\pi + 3i\sin\pi$ $z =$
$z = -4 - 2i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -3 \\ u_{n+1} = u_n + 8 \end{cases}$ $terme\ général$
$f(x) = -5x^9 - 9x^{10} - 5\sin x$ $f'(x) =$	$f(x) = (-4 - 1 + 6x^2)^2$ $f'(x) =$

n°59

19×21	$\lim\limits_{x \to -\infty} \left(\frac{10}{x^5}\right)$
$\cos\left(\frac{\pi}{2} - x\right)$	$A(-2\,;\,-23) et\ H(-24\,;\,25)$ $\overrightarrow{HA}$
$P(x) = x^2 - x$ $\sqrt{\Delta} = 1$ $racines$	$\lvert z\rvert = 8\,; \arg(z) = -\frac{2\pi}{3}$ $z =$
$z = \sqrt{2} - \sqrt{2}\,i$ $\lvert z\rvert\,; \arg(z)$	$\begin{cases} u_0 = 5 \\ u_{n+1} = u_n + 1 \end{cases}$ $u_{10} =$
$f(x) = \left(-4\sin x + \frac{1}{x^4}\right)(-3x - 7x^7)$ $f'(x) =$	$f(x) = \left(\frac{6}{x^5} - 1 - \frac{1}{x^9}\right)^7$ $f'(x) =$

n°60

11×9	$\lim\limits_{x \to +\infty} (11x^8 + x^2 + 2x - 10)$
$-\cos\left(x - \frac{\pi}{2}\right)$	$C\begin{pmatrix}22\\-4\end{pmatrix} et\ H\begin{pmatrix}-22\\16\end{pmatrix}$ $\overrightarrow{HC}$
$P(x) = 3x^2 + 3$ $\Delta =$	$-23i - 46 - 5i + 49$
$z = -8 - 6i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 8 \\ u_{n+1} = u_n - 8 \end{cases}$ $u_8 =$
$f(x) = \dfrac{\frac{-2}{x^5}}{-x^6 - \frac{9}{x^{10}}}$ $f'(x) =$	$f(x) = \cos^3(10 + 7x)$ $f'(x) =$

n°61

$\left(+\frac{8}{4}\right) \times \left(+\frac{4}{8}\right)$	$\lim\limits_{x \to -\infty} \left(\frac{10x^2 - 9x + 12}{6x^2 + 2x - 1}\right)$
$\sin(\pi + x)$	$\vec{u}(3\ ;\ -3)\ et\ \vec{v}(2\ ;\ 2)$ $\vec{u} \cdot \vec{v}$
$P(x) = -x^2 + 6x - 9$ $\sqrt{\Delta} = 0$ $racines$	$z = 5\cos\frac{\pi}{2} + 5i\sin\frac{\pi}{2}$ $z =$
$z = -2 + 10i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -10 \\ u_{n+1} = u_n + 1 \end{cases}$ $u_{12} =$
$f(x) = -7\cos x + \frac{1}{x^8} - \frac{9}{x^6}$ $f'(x) =$	$f(x) = \cos^9(5 - 3x)$ $f'(x) =$

n°62

55×45	$\lim\limits_{x \to -\infty} \left(-\dfrac{9}{4x^2}\right)$
$\sin\left(x + \dfrac{\pi}{2}\right)$	$E\begin{pmatrix}-19\\-3\end{pmatrix} et\ G\begin{pmatrix}20\\-22\end{pmatrix}$ $\overrightarrow{EG}$
$P(x) = 3x^2 - 12 - 9x$ $\sqrt{\Delta} = 15$ $racines$	$50 + 14i - 15 + i$
$z = \sqrt{2}\, i + \sqrt{2}$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -9 \\ u_{n+1} = u_n - 3 \end{cases}$ $u_1 =$
$f(x) = \dfrac{2x^2}{5x^8 + \dfrac{9}{x^{10}}}$ $f'(x) =$	$f(x) = \cos^4(-1 + 8x)$ $f'(x) =$

n°63

$\left(+\frac{20}{20}\right) \times \left(+\frac{30}{25}\right)$	$\lim\limits_{x \to -\infty} \left(\frac{4}{7x^5}\right)$
$\cos(x + \pi)$	$\vec{u}\begin{pmatrix}-6\\-7\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}-5\\-9\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 5x^2 - 9x + 4$ $\Delta =$	$(i - 9)^2$
$z = -4 - 4i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = u_n + 7 \end{cases}$ *terme général*
$f(x) = \dfrac{\frac{7}{x^5}}{-3x + 7\cos x}$ $f'(x) =$	$f(x) = \cos^4(5x + 1)$ $f'(x) =$

n°64

14×6	$\lim\limits_{x \to +\infty} \left(\dfrac{6x^2 - 5x - 4}{8x^2 + x - 3} \right)$
$\sin\left(x + \dfrac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix} 5 \\ -10 \end{pmatrix}$ et $\vec{v}\begin{pmatrix} -2 \\ -1 \end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -8 + 6x - x^2$ $\sqrt{\Delta} = 2$ $racines$	$(5 + 10i)(5 + 5i)$
$z = 7 + 3i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 5 \\ u_{n+1} = u_n + 2 \end{cases}$ $u_{17} =$
$f(x) = -10 \sin x + 6x - 5x^5$ $f'(x) =$	$f(x) = \cos^{10}(9x - 9)$ $f'(x) =$

n°65

$\left(+\frac{15}{4}\right) \times \left(-\frac{4}{20}\right)$	$\lim\limits_{x \to +1} (-4x^5 - 6x)$
$\cos(-x)$	$\vec{u}\begin{pmatrix}-6\\-1\end{pmatrix}$ et $\vec{v}\begin{pmatrix}7\\1\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 15 - 8x + x^2$ $\sqrt{\Delta} = 2$ $racines$	$(-3i + 8)^2$
$z = -1$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -1 \\ u_{n+1} = 9u_n \end{cases}$ $u_3 =$
$f(x) = \left(-10\cos x + \frac{1}{x^3}\right)\left(\frac{2}{x^7} + 4\sqrt{x}\right)$ $f'(x) =$	$f(x) = \cos^4(6 - 10x)$ $f'(x) =$

n°66

20^2	$\lim\limits_{x \to -\infty} \dfrac{1}{x^8}$
$-\cos(-x)$	$H(18\,;\,0) et\ F(-19\,;\,-25)$ $\overrightarrow{FH}$
$P(x) = 3x^2 - 75$ $\sqrt{\Delta} = 30$ $racines$	$z = 4\cos\left(-\dfrac{2\pi}{3}\right) + 4i\sin\left(-\dfrac{2\pi}{3}\right)$ $z =$
$z = -9 + i$ $\lvert z\rvert =$	$\begin{cases} u_0 = 4 \\ u_{n+1} = u_n - 5 \end{cases}$ $terme\ général$
$f(x) = (4x + 10x^2)(-9x^6 - 4x^4)$ $f'(x) =$	$f(x) = \sin^5(4x - 7)$ $f'(x) =$

n°67

25×15	$\lim\limits_{x \to +\infty} \left(-\dfrac{6}{2x^5}\right)$
$\sin(-x)$	$A(-6\,;\,3) et\ E(-10\,;\,5)$ $\|\|\overrightarrow{AE}\|\|$
$P(x) = 5x^2 + 2 + 9x$ $\Delta =$	$z = 2\cos\dfrac{\pi}{3} + 2i\sin\dfrac{\pi}{3}$ $z =$
$z = 10 + 4i$ $\|z\| =$	$\begin{cases} u_0 = 2 \\ u_{n+1} = u_n + 8 \end{cases}$ $u_3 =$
$f(x) = \dfrac{10x^4 - 5x^6}{-7\cos x}$ $f'(x) =$	$f(x) = (x^3 - 7x^5 + 3x^4)^6$ $f'(x) =$

n°68

$\left(+\frac{18}{15}\right) \times \left(+\frac{15}{30}\right)$	$\lim\limits_{x \to -\infty} (-x^{10} + 12x^4 + 11x - 10)$
$\sin(-x)$	$\vec{u}(-8\ ;\ 10)\ et\ \vec{v}(3\ ;\ 0)$ $\vec{u} \cdot \vec{v}$
$P(x) = 3 + 3x^2 + 6x$ $\sqrt{\Delta} = 0$ $racines$	$z = 4\cos 0 + 4i \sin 0$ $z =$
$z = \sqrt{2} - \sqrt{2}\, i$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -5 \\ u_{n+1} = u_n + 7 \end{cases}$ $u_6 =$
$f(x) = (x + 6x^{10})(\cos x - 2x^6)$ $f'(x) =$	$f(x) = \left(-\frac{2}{x} - 4x^5 + 2x^2\right)^5$ $f'(x) =$

n°69

$23^2 - 17^2$	$\lim\limits_{x \to -\infty} \left(\dfrac{9x^2 + 3x - 7}{-9x^2 - 10x + 11} \right)$
$\sin\left(x + \dfrac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix} -2 \\ -6 \end{pmatrix}$ *et* $\vec{v}\begin{pmatrix} 8 \\ -3 \end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -5x^2 - 3x - 2$ $\Delta =$	$(i + 9)^2$
$z = -9 - 8i$ $\lvert z \rvert =$	$\begin{cases} u_0 = -9 \\ u_{n+1} = u_n + 3 \end{cases}$ *terme général*
$f(x) = \left(\dfrac{4}{x^8} + x^6\right)\left(-4x^9 + \dfrac{9}{x^2}\right)$ $f'(x) =$	$f(x) = (2x^7 + 4x^3 - 3x^7)^7$ $f'(x) =$

n°70

15^2	$\lim\limits_{x \to +\infty} \left(\dfrac{2x^2 - 11x - 11}{10x^2 + 10x + 7} \right)$
$-\sin\left(x - \dfrac{\pi}{2}\right)$	$G(-9\,;\,20) et\ A(16\,;\,-7)$ $\overrightarrow{GA}$
$P(x) = -5x^2 + 2 + 6x$ $\Delta =$	$(-3 + 7i)(-4i - 10)$
$z = -\sqrt{2} - \sqrt{2}\, i$ $\lvert z \rvert\,;\arg(z)$	$\begin{cases} u_0 = 2 \\ u_{n+1} = u_n + 4 \end{cases}$ *terme général*
$f(x) = \dfrac{4}{x^9} - 9\cos x - 9x^7$ $f'(x) =$	$f(x) = \left(\dfrac{2}{x^6} - 8x^{10} - \dfrac{1}{x^3} \right)^7$ $f'(x) =$

n°71

13^2	$\lim\limits_{\substack{x\to 0\\ x>0}} \left(-\frac{11}{x^1}\right)$
$-\cos\left(\frac{\pi}{2}+x\right)$	$G\begin{pmatrix}-3\\-8\end{pmatrix} et\ H\begin{pmatrix}2\\1\end{pmatrix}$ $\left\|\overrightarrow{GH}\right\|$
$P(x)=-3x^2+15x-18$ $\sqrt{\Delta}=3$ $racines$	$\|z\|=1\,;\arg(z)=\frac{3\pi}{6}$ $z=$
$z=\sqrt{3}-i$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=4\\u_{n+1}=u_n+5\end{cases}$ $terme\ général$
$f(x)=-6\cos(-2x-5)$ $f'(x)=$	$f(x)=\sin^8(-9x+4)$ $f'(x)=$

n°72

$25^2 - 35^2$	$\lim\limits_{x \to -\infty} \left(\dfrac{-11x^2 + 10x - 6}{8x^2 - 3x - 7} \right)$
$\sin(-x)$	$G \begin{pmatrix} -18 \\ 11 \end{pmatrix} et\ C \begin{pmatrix} 10 \\ 17 \end{pmatrix}$ $\overrightarrow{CG}$
$P(x) = 5x^2 + 9x + 2$ $\Delta =$	$z = 10\cos 0 + 10i \sin 0$ $z =$
$z = -\sqrt{2}\, i - \sqrt{2}$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -2 \\ u_{n+1} = 0u_n \end{cases}$ $u_{20} =$
$f(x) = 2\sin(-4x - 3)$ $f'(x) =$	$f(x) = \cos^2(5 + 8x)$ $f'(x) =$

n°73

$33^2 - 27^2$		$\lim\limits_{x \to +\infty} \left(\frac{2}{7x^5}\right)$
$-\sin(-x)$		$A\begin{pmatrix}-9\\-22\end{pmatrix} et\ D\begin{pmatrix}-2\\23\end{pmatrix}$ $\overrightarrow{AD}$
$P(x) = -x + 5x^2$ $\Delta =$		$(-2-1i)(-2-6i)$
$z = -\sqrt{2} - \sqrt{2}\,i$ $\lvert z\rvert\ ; \arg(z)$		$\begin{cases} u_0 = 7 \\ u_{n+1} = -1u_n \end{cases}$ *terme général*
$f(x) = \frac{10}{x^5} + \frac{2}{x^5} + \frac{5}{x^4}$ $f'(x) =$		$f(x) = \sin^5(7x+5)$ $f'(x) =$

n°74

28^2	$\lim\limits_{x\to+\infty}\left(\dfrac{12}{4x^9}\right)$
$\cos\left(\dfrac{\pi}{2}-x\right)$	$G(-1\,;\,-3) et\ H(-10\,;\,8)$ $\left\|\overrightarrow{GH}\right\|$
$P(x)=-5-8x-3x^2$ $\Delta=$	$\|z\|=5\,;\arg(z)=-\dfrac{\pi}{2}$ $z=$
$z=4-2i$ $\|z\|=$	$\begin{cases}u_0=1\\u_{n+1}=-1u_n\end{cases}$ $u_{16}=$
$f(x)=\dfrac{-6x^7}{-x+6\cos x}$ $f'(x)=$	$f(x)=\left(-\dfrac{10}{x^5}-\dfrac{1}{x^9}\right)^{10}$ $f'(x)=$

n°75

$\left(+\frac{5}{30}\right)\times\left(-\frac{30}{2}\right)$	$\lim\limits_{x\to-\infty}(-6x^4-11x^3+3x^2)$
$\sin\left(\frac{\pi}{2}+x\right)$	$B(-8\,;\,8) et\ G(-8\,;\,-7)$ $\left\|\overrightarrow{BG}\right\|$
$P(x)=6x+5x^2\ +2$ $\Delta=$	$\|z\|=9\,;\arg(z)=0$ $z=$
$z=-\sqrt{3}-i$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=10\\u_{n+1}=-6u_n\end{cases}$ $u_4=$
$f(x)=-x^6-\frac{5}{x^7}-9x^{10}$ $f'(x)=$	$f(x)=\sin^5(-9x-3)$ $f'(x)=$

n°76

$\frac{10}{1} - \frac{3}{2}$	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(-\frac{7}{12x^7}\right)$
$\sin(\pi + x)$	$\vec{u}\begin{pmatrix}9\\8\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}4\\1\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 3x^2 - x + 3$ $\Delta =$	$(-10i - 6)(6i + 7)$
$z = \sqrt{2} - \sqrt{2}\, i$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = 2 \\ u_{n+1} = u_n + 4 \end{cases}$ *terme général*
$f(x) = \frac{-2\cos x}{x^6 + x}$ $f'(x) =$	$f(x) = \left(6x^8 - \frac{1}{x^4} + 6\right)^4$ $f'(x) =$

n°77

$\frac{1}{10}-\frac{1}{8}$	$\lim\limits_{x\to+\infty}\left(\frac{9}{x^9}\right)$
$\cos\left(\frac{\pi}{2}-x\right)$	$B\begin{pmatrix}19\\19\end{pmatrix}et\ D\begin{pmatrix}-21\\-23\end{pmatrix}$ $\overrightarrow{DB}$
$P(x)=-16x-4x^2+20$ $\sqrt{\Delta}=24$ $racines$	$\lvert z\rvert=2\,;\arg(z)=-\frac{2\pi}{3}$ $z=$
$z=-\sqrt{2}\,i-\sqrt{2}$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=1\\u_{n+1}=10u_n\end{cases}$ $u_9=$
$f(x)=\cos(-6x+8)$ $f'(x)=$	$f(x)=\cos^4(-9x+4)$ $f'(x)=$

n°78

26^2	$\lim\limits_{x\to-\infty}\left(-\frac{5}{x^6}\right)$
$\sin\left(\frac{\pi}{2}-x\right)$	$E\begin{pmatrix}3\\-9\end{pmatrix} et\ B\begin{pmatrix}2\\-8\end{pmatrix}$ $\left\|\overrightarrow{BE}\right\|$
$P(x)=-30+2x^2\ -4x$ $\sqrt{\Delta}=16$ $racines$	$-20i-11+15-30i$
$z=6+3i$ $\|z\|=$	$\begin{cases}u_0=-1\\u_{n+1}=u_n-5\end{cases}$ $u_{15}=$
$f(x)=5\cos(3x+1)$ $f'(x)=$	$f(x)=(6+7x^9-9x^4)^2$ $f'(x)=$

n°79

$6^2 - 14^2$	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(-\frac{7}{10x^2}\right)$
$\sin(-x)$	$\vec{u}\begin{pmatrix}-6\\-7\end{pmatrix}$ et $\vec{v}\begin{pmatrix}-6\\-8\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -2x^2 + 3 - 7x$ $\Delta =$	$(-3 + 4i)(-3 - 7i)$
$z = \sqrt{3}\, i - 1$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = 0 \\ u_{n+1} = -5u_n \end{cases}$ $u_2 =$
$f(x) = (9\cos x + 6x^5)\left(\frac{9}{x^2} + \frac{6}{x^8}\right)$ $f'(x) =$	$f(x) = \cos(x + 1)$ $f'(x) =$

n°80

$53^2 - 47^2$	$\lim\limits_{x \to -\infty} \left(\dfrac{-11x^2 + 3x + 9}{-6x^2 + 11x + 3} \right)$
$\sin(\pi - x)$	$F(-22\,;\,12) et\ C(14\,;\,16)$ $\overrightarrow{CF}$
$P(x) = x^2 + 3x - 2$ $\Delta =$	$(-i - 5)(1 + 6i)$
$z = -5 + 5i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 8 \\ u_{n+1} = -2u_n \end{cases}$ *terme général*
$f(x) = \dfrac{-4x^3}{-7\sin x - 10x^7}$ $f'(x) =$	$f(x) = \left(3x^9 - 3 - \dfrac{5}{x^4} \right)^{10}$ $f'(x) =$

n°81

17^2	$\lim\limits_{x\to+\infty}\left(\dfrac{4x^2-5x-5}{x^2+12x-2}\right)$
$\sin(-x)$	$F\begin{pmatrix}7\\2\end{pmatrix}$ *et* $C\begin{pmatrix}3\\2\end{pmatrix}$ $\left\|\overrightarrow{FC}\right\|$
$P(x)=3x^2-x+1$ $\Delta=$	$\|z\|=7\,;\arg(z)=\dfrac{5\pi}{6}$ $z=$
$z=-10+4i$ $\|z\|=$	$\begin{cases}u_0=0\\u_{n+1}=-4u_n\end{cases}$ *terme général*
$f(x)=-2\sin(8x-2)$ $f'(x)=$	$f(x)=(-6x^5+8x^7+4x^3)^5$ $f'(x)=$

n°82

$24^2 - 16^2$	$\lim\limits_{x \to -1} (-x^8 - 6x^3 - 3x^2 + 3x)$
$-\sin(-x)$	$\vec{u}\begin{pmatrix}-2\\-6\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}-3\\2\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = 3x^2 - 3$ $\sqrt{\Delta} = 6$ *racines*	$z = 3\cos\frac{\pi}{2} + 3i\sin\frac{\pi}{2}$ $z =$
$z = -\sqrt{2} - \sqrt{2}\,i$ $\lvert z\rvert$; $\arg(z)$	$\begin{cases} u_0 = -8 \\ u_{n+1} = 9u_n \end{cases}$ *terme général*
$f(x) = \frac{-1}{x} + 5\sin x + x^5$ $f'(x) =$	$f(x) = \left(\frac{1}{x^4} + 9x - 5\right)^4$ $f'(x) =$

n°83

19^2	$\lim\limits_{\substack{x\to 0\\ x>0}} \left(\frac{7}{8x^3}\right)$
$\sin(x-\pi)$	$A\begin{pmatrix}-7\\-2\end{pmatrix} et\ G\begin{pmatrix}-1\\-2\end{pmatrix}$ $\left\|\overrightarrow{GA}\right\|$
$P(x) = 21x + 3x^2 + 36$ $\sqrt{\Delta} = 3$ $racines$	$41i - 37 + 46 + 35i$
$z = \sqrt{2}\,i + \sqrt{2}$ $\|z\|\ ;\arg(z)$	$\begin{cases}u_0 = 8\\u_{n+1} = -6u_n\end{cases}$ $u_4 =$
$f(x) = (-10x^6 - 8x^{10})\left(\frac{-8}{x^9} - \frac{6}{x^7}\right)$ $f'(x) =$	$f(x) = \left(-\frac{2}{x^8} + 6x^2\right)^5$ $f'(x) =$

n°84

$\frac{8}{5} - \frac{9}{2}$	$\lim\limits_{\substack{x \to 0 \\ x<0}} \left(\frac{6}{x^1}\right)$
$-\sin(-x)$	$C(1\,;\,-10) et\ D(10\,;\,-9)$ $\left\|\left\|\overrightarrow{DC}\right\|\right\|$
$P(x) = 2x^2 - 2x - 4$ $\Delta =$	$(5+4i)(5-4i)$
$z = -\sqrt{2} + \sqrt{2}\,i$ $\|z\|\,;\arg(z)$	$\begin{cases} u_0 = -5 \\ u_{n+1} = 3u_n \end{cases}$ *terme général*
$f(x) = -4\cos(-7x+2)$ $f'(x) =$	$f(x) = \sin^6(-10-3x)$ $f'(x) =$

n°85

$\frac{6}{5} - \frac{9}{3}$	$\lim\limits_{x \to +\infty} \left(\frac{-12x^2 + 9x + 2}{9x^2 + 4x - 6} \right)$
$\cos\left(\frac{\pi}{2} + x\right)$	$\vec{u}(-8\ ;\ 7)\ et\ \vec{v}(9\ ;\ -3)$ $\vec{u} \cdot \vec{v}$
$P(x) = -2x^2 - 6x - 5$ $\Delta =$	$\lvert z \rvert = 3\ ; \arg(z) = 0$ $z =$
$z = -9 + 2i$ $\lvert z \rvert =$	$\begin{cases} u_0 = 10 \\ u_{n+1} = -10u_n \end{cases}$ $u_{18} =$
$f(x) = \frac{\frac{-1}{x^6}}{10x^4 - 9\cos x}$ $f'(x) =$	$f(x) = \cos^7(8x - 7)$ $f'(x) =$

n°86

$\frac{10}{1} - \frac{1}{3}$	$\lim\limits_{x \to +\infty} \left(-\frac{7}{x^2}\right)$
$-\cos(-x)$	$\vec{u}(7\ ;\ -10)\ et\ \vec{v}(5\ ;\ 7)$ $\vec{u} \cdot \vec{v}$
$P(x) = 25 - 30x + 5x^2$ $\sqrt{\Delta} = 20$ $racines$	$\lvert z \rvert = 6\ ; \arg(z) = \frac{3\pi}{4}$ $z =$
$z = -\sqrt{2} - \sqrt{2}\,i$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = -1 \\ u_{n+1} = u_n + 8 \end{cases}$ $terme\ général$
$f(x) = \frac{x^8 - 7\cos x}{10x^3}$ $f'(x) =$	$f(x) = \left(6x^8 + \frac{4}{x^9} - \frac{7}{x^4}\right)^4$ $f'(x) =$

n°87

$-\frac{10}{5}-\frac{9}{4}$	$\lim\limits_{x\to-\infty}(9x^3+3x^2-12x-11)$
$-\sin(x-\pi)$	$\vec{u}(7\,;\,-2)\ et\ \vec{v}(-3\,;\,-5)$ $\vec{u}\cdot\vec{v}$
$P(x)=x^2+3+8x$ $\Delta=$	$\lvert z\rvert=9\,;\arg(z)=-\frac{\pi}{3}$ $z=$
$z=i+\sqrt{3}$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=7\\u_{n+1}=u_n-7\end{cases}$ $terme\ général$
$f(x)=\dfrac{\frac{4}{x^8}+5\sqrt{x}}{3\sin x}$ $f'(x)=$	$f(x)=\sin^7(-4x+1)$ $f'(x)=$

n°88

$46^2 - 54^2$	$\lim\limits_{x \to +\infty} \left(\dfrac{5x^2 + x + 7}{2x^2 - x + 10} \right)$
$\sin\left(x + \dfrac{\pi}{2}\right)$	$A(-3\,;\,1) et\ F(-2\,;\,3)$ $\left\|\overrightarrow{AF}\right\|$
$P(x) = -x^2 + 1 + 6x$ $\Delta =$	$\|z\| = 5\,;\arg(z) = \dfrac{2\pi}{6}$ $z =$
$z = -\sqrt{3}\,i - 1$ $\|z\|\,;\arg(z)$	$\begin{cases} u_0 = 9 \\ u_{n+1} = u_n + 10 \end{cases}$ $u_4 =$
$f(x) = \dfrac{\dfrac{2}{x^7} - 5x^5}{9\sin x}$ $f'(x) =$	$f(x) = \sin(1 - 2x)$ $f'(x) =$

n°89

$-\frac{9}{8}-\frac{9}{9}$	$\lim\limits_{x\to-\infty}\left(\frac{1}{6x^4}\right)$
$\sin\left(x+\frac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix}0\\-1\end{pmatrix}$ et $\vec{v}\begin{pmatrix}7\\2\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x)=-2x^2-14x-20$ $\sqrt{\Delta}=6$ $racines$	$\lvert z\rvert=6\,;\arg(z)=\frac{\pi}{3}$ $z=$
$z=10+7i$ $\lvert z\rvert=$	$\begin{cases}u_0=-6\\u_{n+1}=8u_n\end{cases}$ $u_{19}=$
$f(x)=\dfrac{-4x^{10}-\frac{8}{x^9}}{-5x^8}$ $f'(x)=$	$f(x)=\cos^5(4+7x)$ $f'(x)=$

n°90

52×48	$\lim\limits_{\substack{x \to 0 \\ x<0}} \left(-\frac{1}{6x^7}\right)$
$-\cos\left(x+\frac{\pi}{2}\right)$	$\vec{u}\begin{pmatrix}0\\-7\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}9\\7\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x) = -3 - 6x + 2x^2$ $\Delta =$	$z = 9\cos\frac{\pi}{6} + 9i\sin\frac{\pi}{6}$ $z =$
$z = -i - \sqrt{3}$ $\lvert z\rvert$; $\arg(z)$	$\begin{cases} u_0 = -6 \\ u_{n+1} = -3u_n \end{cases}$ *terme général*
$f(x) = \frac{5x^8 - 7\sqrt{x}}{-x}$ $f'(x) =$	$f(x) = \sin^6(-4x-1)$ $f'(x) =$

n°91

37×43	$\lim\limits_{\substack{x \to 0 \\ x>0}} \left(\frac{11}{x^2}\right)$
$-\sin\left(\frac{\pi}{2} - x\right)$	$\vec{u}\begin{pmatrix}-4\\1\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}5\\-3\end{pmatrix}$ $\vec{u} \cdot \vec{v}$
$P(x) = -3x^2 + 24 - 6x$ $\sqrt{\Delta} = 18$ *racines*	$(12 + 4i)^2$
$z = \sqrt{3}\, i + 1$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = -4 \\ u_{n+1} = u_n - 5 \end{cases}$ *terme général*
$f(x) = 10\cos(-3x - 9)$ $f'(x) =$	$f(x) = \left(5x^{10} + \frac{3}{x^2} + 8x^6\right)^4$ $f'(x) =$

n°92

$\left(+\frac{12}{8}\right)\times\left(+\frac{6}{2}\right)$	$\lim\limits_{x\to-1}\left(\frac{10x^2+12x+12}{-8x^2+x+9}\right)$
$-\cos(-x)$	$C\begin{pmatrix}4\\2\end{pmatrix}et\ B\begin{pmatrix}5\\10\end{pmatrix}$ $\left\|\overrightarrow{BC}\right\|$
$P(x)=-x^2+3-x$ $\Delta=$	$(6-4i)(6+7i)$
$z=-9+9i$ $\|z\|=$	$\begin{cases}u_0=0\\u_{n+1}=-1u_n\end{cases}$ $u_6=$
$f(x)=-7x-6x^3+\frac{1}{x^5}$ $f'(x)=$	$f(x)=\left(8x^7+8x^9+\frac{8}{x^9}\right)^5$ $f'(x)=$

n°93

$\left(-\frac{6}{4}\right) \times \left(-\frac{1}{12}\right)$	$\lim\limits_{x \to -\infty} (-4x^6 + 5x^5 - 2x^2 + 5)$
$\sin\left(\frac{\pi}{2} - x\right)$	$\vec{u}(2\ ;\ -10)\ et\ \vec{v}(8\ ;\ 0)$ $\vec{u} \cdot \vec{v}$
$P(x) = -x^2 + 4x - 1$ $\Delta =$	$z = 5\cos\frac{\pi}{3} + 5i\sin\frac{\pi}{3}$ $z =$
$z = -1$ $\lvert z \rvert\ ; \arg(z)$	$\begin{cases} u_0 = 5 \\ u_{n+1} = u_n - 9 \end{cases}$ $terme\ général$
$f(x) = \frac{4}{x^4} + \frac{4}{x^9} + 2x^6$ $f'(x) =$	$f(x) = \cos^4(-4x - 3)$ $f'(x) =$

n°94

$-\frac{10}{1}-\frac{9}{5}$	$\lim\limits_{x\to-\infty}\left(\frac{12}{6x^6}\right)$
$\sin\left(\frac{\pi}{2}-x\right)$	$H(24\,;\,-23) et\ B(-16\,;\,-14)$ $\overrightarrow{HB}$
$P(x)=-x^2+20+x$ $\sqrt{\Delta}=9$ $racines$	$(3i+8)(3i-8)$
$z=-1$ $\lvert z\rvert\,;\arg(z)$	$\begin{cases}u_0=0\\u_{n+1}=8u_n\end{cases}$ $u_4=$
$f(x)=\sin(9x+1)$ $f'(x)=$	$f(x)=\sin^4(6-10x)$ $f'(x)=$

n°95

34×26	$\lim\limits_{x \to +\infty} \left(\dfrac{-6x^2 + 9x - 5}{-9x^2 - 6x - 10} \right)$
$-\cos(x - \pi)$	$G\begin{pmatrix} -7 \\ -2 \end{pmatrix} et\ F\begin{pmatrix} -9 \\ -6 \end{pmatrix}$ $\left\|\overrightarrow{FG}\right\|$
$P(x) = 8x + 4x^2$ $\sqrt{\Delta} = 8$ $racines$	$z = 3\cos\left(-\dfrac{\pi}{2}\right) + 3i\sin\left(-\dfrac{\pi}{2}\right)$ $z =$
$z = -\sqrt{3} + i$ $\lvert z \rvert$; $\arg(z)$	$\begin{cases} u_0 = 7 \\ u_{n+1} = -7u_n \end{cases}$ $u_{12} =$
$f(x) = -5x^7 - \dfrac{1}{x^7} - \dfrac{9}{x^7}$ $f'(x) =$	$f(x) = (7x^9 + 10 - 9x^5)^{10}$ $f'(x) =$

n°96

20^2	$\lim\limits_{x\to+\infty}\left(\dfrac{6x^2+9x-3}{-8x^2-8x+10}\right)$
$-\cos(\pi+x)$	$\vec{u}(9\,;\,4)\ et\ \vec{v}(-4\,;\,-6)$ $\vec{u}\cdot\vec{v}$
$P(x)=-1+5x^2-7x$ $\Delta=$	$z=\cos\dfrac{3\pi}{4}+i\sin\dfrac{3\pi}{4}$ $z=$
$z=6-8i$ $\lvert z\rvert=$	$\begin{cases}u_0=-3\\u_{n+1}=u_n+2\end{cases}$ $terme\ général$
$f(x)=-9x^{10}-8\sin x-\dfrac{5}{x^3}$ $f'(x)=$	$f(x)=(7x^5-4x^{10}-9x^6)^8$ $f'(x)=$

n°97

28^2	$\lim\limits_{\substack{x\to 0\\ x>0}} \left(\frac{1}{3x^7}\right)$
$\cos\left(\frac{\pi}{2} - x\right)$	$\vec{u}\begin{pmatrix}-1\\5\end{pmatrix}$ *et* $\vec{v}\begin{pmatrix}8\\2\end{pmatrix}$ $\vec{u}\cdot\vec{v}$
$P(x) = 10x - 4x^2$ $\Delta =$	$\lvert z\rvert = 8\,;\arg(z) = \pi$ $z =$
$z = -2 - 8i$ $\lvert z\rvert =$	$\begin{cases}u_0 = 2\\ u_{n+1} = u_n + 1\end{cases}$ *terme général*
$f(x) = \dfrac{\frac{-5}{x^{10}}}{-8x^8 + 6x}$ $f'(x) =$	$f(x) = \left(-\frac{7}{x^8} + 5x^8 + 3x^4\right)^7$ $f'(x) =$

n°98

$\left(+\frac{16}{12}\right)\times\left(-\frac{24}{20}\right)$	$\lim\limits_{\substack{x\to 0\\ x>0}}\left(\frac{1}{2x^4}\right)$
$-\sin(-x)$	$H(-10\,;\,4) et\ B(8\,;\,7)$ $\left\|\overrightarrow{HB}\right\|$
$P(x)=-4x^2+36$ $\sqrt{\Delta}=24$ $racines$	$(9+i)(9-i)$
$z=-1-\sqrt{3}\,i$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=6\\ u_{n+1}=1u_n\end{cases}$ $terme\ général$
$f(x)=-7\sin(-10x-5)$ $f'(x)=$	$f(x)=\left(-\frac{1}{x^8}-6x+4x^6\right)^7$ $f'(x)=$

n°99

$-\frac{6}{3}-\frac{5}{10}$	$\lim\limits_{x\to-\infty}\left(\frac{11}{x^2}\right)$
$-\cos(-x)$	$A(3\,;\,-1) et\ C(-10\,;\,1)$ $\|\|\overrightarrow{AC}\|\|$
$P(x)=3x^2\ -12x-15$ $\sqrt{\Delta}=18$ $racines$	$z=\cos\left(-\frac{\pi}{4}\right)+i\sin\left(-\frac{\pi}{4}\right)$ $z=$
$z=-\sqrt{3}+i$ $\|z\|\,;\arg(z)$	$\begin{cases}u_0=10\\u_{n+1}=u_n-6\end{cases}$ $u_{18}=$
$f(x)=2x^4+\frac{5}{x^{10}}+\frac{2}{x^{10}}$ $f'(x)=$	$f(x)=(2x^4-8x^5-9x^2)^4$ $f'(x)=$