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**DÉTERMINER LE DOMAINE DE DÉFINITION DES FONCTIONS SUIVANTES:**

- 1)  $f(x) = \text{Arcsin}(3 - x^2)$
- 2)  $f(x) = \text{Arctg}\left(\frac{1}{x-2}\right)$
- 3)  $f(x) = \text{Arccos}(x^2 - 2x)$
- 4)  $f(x) = \frac{2}{\text{Arcsin}(3x)}$
- 5)  $f(x) = \frac{\text{Arccos}(2x)}{\text{Arctg}\left(\frac{x}{2}\right)}$
- 6)  $f(x) = \text{Arcsin}(-x^2 - 2x + 1)$
- 7)  $f(x) = \text{Arcsin}(2 - 5x)$
- 8)  $f(x) = \text{Arccos}\left(\frac{1}{x}\right)$
- 9)  $f(x) = \text{Arcsin}(3x) - \text{Arccos}(2x)$
- 10)  $f(x) = \text{Arctg}(6x^2 - 3x)$
- 11)  $f(x) = \text{Arccos}\left(\frac{x}{x+1}\right)$
- 12)  $f(x) = \text{Arctg} \frac{2x+1}{x+1}$

## SOLUTIONS DÉTAILLÉES

■ 1)  $f(x) = \text{Arcsin}(3 - x^2)$

$$-1 \leq 3 - x^2 \leq 1$$

$$-1 \leq 3 - x^2$$

$$x^2 - 4 \leq 0$$

$$x^2 - 4 \leq 0$$

et

$$3 - x^2 \leq 1$$

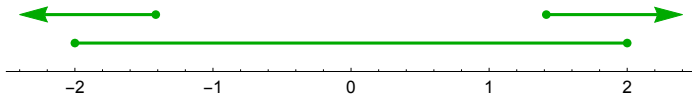
$$2 - x^2 \leq 0$$

$$2 - x^2 \leq 0$$

$x$		-2		2	
$x^2 - 4$	+	0	-	0	+

$x$		$-\sqrt{2}$		$\sqrt{2}$	
$2 - x^2$	-	0	+	0	-

$$([-2; 2]) \cap (\leftarrow; -\sqrt{2}] \cup [\sqrt{2}; \rightarrow) = [-2; -\sqrt{2}] \cup [\sqrt{2}; 2]$$



$$\text{dom } f = [-2; -\sqrt{2}] \cup [\sqrt{2}; 2]$$

■ 2)  $f(x) = \text{Arctg}\left(\frac{1}{x-2}\right)$

$$x - 2 \neq 0 \Leftrightarrow x \neq 2 \Leftrightarrow x \in \mathbb{R} \setminus \{2\}$$



$$\text{dom } f = \mathbb{R} \setminus \{2\}$$

■ 3)  $f(x) = \text{Arccos}(x^2 - 2x)$

$$-1 \leq x^2 - 2x \leq 1$$

$$-1 \leq x^2 - 2x$$

$$-x^2 + 2x - 1 \leq 0$$

$$-x^2 + 2x - 1 \leq 0$$

et

$$x^2 - 2x \leq 1$$

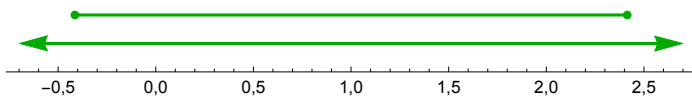
$$x^2 - 2x - 1 \leq 0$$

$$x^2 - 2x - 1 \leq 0$$

$x$		1	
$-x^2 + 2x - 1$	-	0	-

$x$		$1 - \sqrt{2}$		$1 + \sqrt{2}$	
$x^2 - 2x - 1$	+	0	-	0	+

$$(\mathbb{R}) \cap ([1 - \sqrt{2}; 1 + \sqrt{2}]) = [1 - \sqrt{2}; 1 + \sqrt{2}]$$



$$\text{dom } f = [1 - \sqrt{2}; 1 + \sqrt{2}]$$

■ 4)  $f(x) = \frac{2}{\text{Arcsin}(3x)}$

$$\text{Arcsin}(3x) \neq 0 \Leftrightarrow x \neq 0$$

$$\text{et } -1 \leq 3x \leq 1$$

$$-1 \leq 3x$$

$$-3x - 1 \leq 0$$

$$-3x - 1 \leq 0$$

et

$$3x \leq 1$$

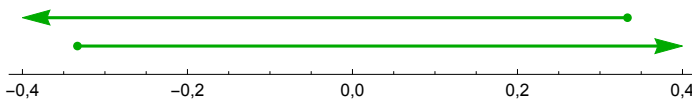
$$3x - 1 \leq 0$$

$$3x - 1 \leq 0$$

$x$		$-\frac{1}{3}$	
$-3x - 1$	+	0	-

$x$		$\frac{1}{3}$	
$3x - 1$	-	0	+

$$\left(-\frac{1}{3}; \rightarrow\right) \cap \left(\leftarrow; \frac{1}{3}\right) = \left[-\frac{1}{3}; \frac{1}{3}\right]$$



$$\text{dom } f = \left[-\frac{1}{3}; 0[ \cup ]0; \frac{1}{3}\right]$$

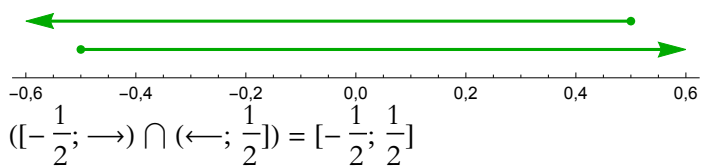
■ 5)  $f(x) = \frac{\text{Arccos}(2x)}{\text{Arctg}\left(\frac{x}{2}\right)}$

$\text{Arctg}\left(\frac{x}{2}\right) \neq 0 \Leftrightarrow x \neq 0 \Leftrightarrow x \in \mathbb{R} \setminus \{0\}$

$-1 \leq 2x \leq 1$

$-1 \leq 2x$  et  $2x \leq 1$

$x \geq \frac{-1}{2}$  et  $x \leq \frac{1}{2}$



$\text{dom } f = [-\frac{1}{2}; 0[ \cup ]0; \frac{1}{2}]$

■ 6)  $f(x) = \text{Arcsin}(-x^2 - 2x + 1)$

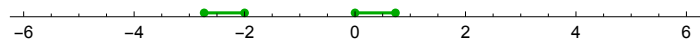
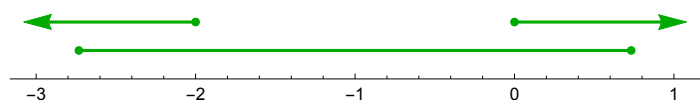
$-1 \leq -x^2 - 2x + 1 \leq 1$

$-1 \leq -x^2 - 2x + 1$  et  $-x^2 - 2x + 1 \leq 1$

$x^2 + 2x - 2 \leq 0$  et  $-x^2 - 2x \leq 0$

$x$		$-1 - \sqrt{3}$		$-1 + \sqrt{3}$	
$x^2 + 2x - 2$	+	0	-	0	+

$x$		$-2$		$0$	
$-x^2 - 2x$	-	0	+	0	-



$([-1 - \sqrt{3}; -1 + \sqrt{3}]) \cap (\leftarrow; -2] \cup [0; \rightarrow) = [-1 - \sqrt{3}; -2] \cup [0; -1 + \sqrt{3}]$

$\text{dom } f = [-1 - \sqrt{3}; -2] \cup [0; -1 + \sqrt{3}]$

■ 7)  $f(x) = \text{Arcsin}(2 - 5x)$

$-1 \leq 2 - 5x \leq 1$

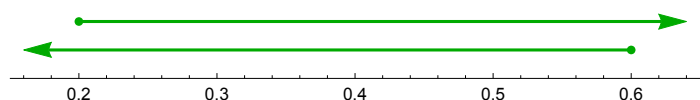
$-1 \leq 2 - 5x$  et  $2 - 5x \leq 1$

$5x - 3 \leq 0$  et  $1 - 5x \leq 0$

$x$		$\frac{3}{5}$	
$5x - 3$	-	0	+

$x$		$\frac{1}{5}$	
$1 - 5x$	+	0	-

$(\leftarrow; \frac{3}{5}) \cap (\frac{1}{5}; \rightarrow) = [\frac{1}{5}; \frac{3}{5}]$



$\text{dom } f = [\frac{1}{5}; \frac{3}{5}]$

■ 8)  $f(x) = \text{Arccos}\left(\frac{1}{x}\right)$

$x \neq 0$  et

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 $-1 \leq \frac{x}{1-x} \leq 1$

$-1 \leq \frac{1}{x}$  et  $\frac{1}{x} \leq 1$

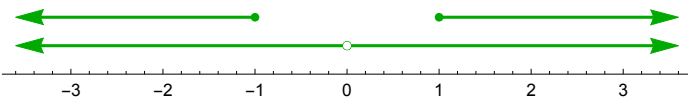
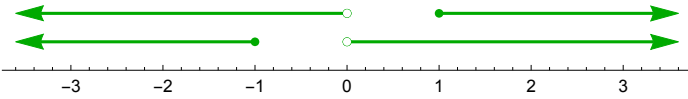
$-1 - \frac{1}{x} \leq 0$  et  $\frac{1}{x} - 1 \leq 0$

$\frac{-x-1}{x} \leq 0$  et  $\frac{1-x}{x} \leq 0$

$x$		-1		0	
$\frac{-x-1}{x}$	-	0	+		-

$x$		0		1	
$\frac{1-x}{x}$	-		+	0	-

$(\leftarrow; -1] \cup ]0; \rightarrow) \cap (\leftarrow; 0[ \cup ]1; \rightarrow) = \leftarrow; -1] \cup ]1; \rightarrow$



$\text{dom } f = \leftarrow; -1] \cup ]1; \rightarrow$

■ 9)  $f(x) = \text{Arcsin}(3x) - \text{Arccos}(2x)$

$-1 \leq 2x \leq 1$

$-1 \leq 2x$  et  $2x \leq 1$

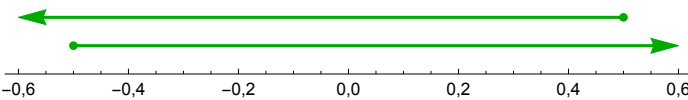
$-2x-1 \leq 0$  et  $2x-1 \leq 0$

$-2x-1 \leq 0$  et  $2x-1 \leq 0$

$x$		$-\frac{1}{2}$	
$-2x-1$	+	0	-

$x$		$\frac{1}{2}$	
$2x-1$	-	0	+

$([-\frac{1}{2}; \rightarrow) \cap (\leftarrow; \frac{1}{2}]) = [-\frac{1}{2}; \frac{1}{2}]$



$-1 \leq 3x \leq 1$

$-1 \leq 3x$  et  $3x \leq 1$

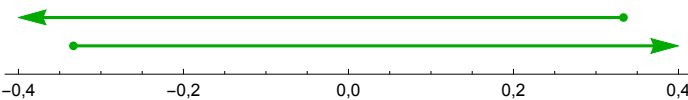
$-3x-1 \leq 0$  et  $3x-1 \leq 0$

$-3x-1 \leq 0$  et  $3x-1 \leq 0$

$x$		$-\frac{1}{3}$	
$-3x-1$	+	0	-

$x$		$\frac{1}{3}$	
$3x-1$	-	0	+

$([-\frac{1}{3}; \rightarrow) \cap (\leftarrow; \frac{1}{3}]) = [-\frac{1}{3}; \frac{1}{3}]$



$\text{dom } f = [-\frac{1}{3}; \frac{1}{3}]$

■ 10)  $f(x) = \text{Arctg}(6x^2 - 3x)$

$\text{dom } f = \mathbb{R}$

■ 11)  $f(x) = \text{Arccos}\left(\frac{x}{x+1}\right)$

$x+1 \neq 0 \Leftrightarrow x \neq -1 \Leftrightarrow x \in \mathbb{R} \setminus \{-1\}$

$-1 \leq \frac{x}{x+1} \leq 1$

$-1 \leq \frac{x}{x+1}$  et  $\frac{x}{x+1} \leq 1$

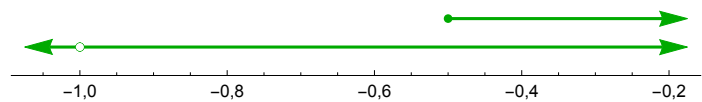
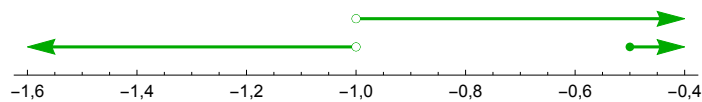
$-\frac{x}{x+1} - 1 \leq 0$  et  $\frac{x}{x+1} - 1 \leq 0$

$\frac{-2x-1}{x+1} \leq 0$  et  $-\frac{1}{x+1} \leq 0$

$x$		$-1$		$-\frac{1}{2}$	
$\frac{-2x-1}{x+1}$	-		+	0	-

$x$		$-1$	
$-\frac{1}{x+1}$	+		-

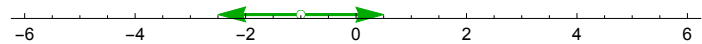
$(\leftarrow; -1[ \cup [-\frac{1}{2}; \rightarrow) \cap (]-1; \rightarrow) = [-\frac{1}{2}; \rightarrow$



$\text{dom } f = [-\frac{1}{2}; \rightarrow$

■ 12)  $f(x) = \text{Arctg} \frac{2x+1}{x+1}$

$x+1 \neq 0 \Leftrightarrow x \neq -1 \Leftrightarrow x \in \mathbb{R} \setminus \{-1\}$



$\text{dom } f = \mathbb{R} \setminus \{-1\}$