

Trigonométrie rectiligne

$$\sin(\theta) = \frac{\text{Opp}}{\text{Hyp}}$$

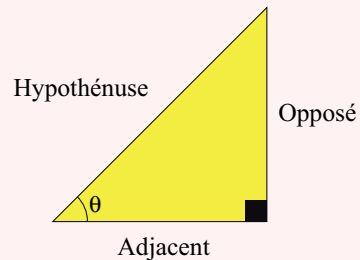
$$\csc(\theta) = \frac{\text{Hyp}}{\text{Opp}}$$

$$\cos(\theta) = \frac{\text{Adj}}{\text{Hyp}}$$

$$\sec(\theta) = \frac{\text{Hyp}}{\text{Adj}}$$

$$\tan(\theta) = \frac{\text{Opp}}{\text{Adj}}$$

$$\cot(\theta) = \frac{\text{Adj}}{\text{Opp}}$$



Relations inverses

$$\csc(x) \equiv \frac{1}{\sin(x)} \quad \sec(x) \equiv \frac{1}{\cos(x)} \quad \cot(x) \equiv \frac{1}{\tan(x)}$$

Relations quotients

$$\tan(x) \equiv \frac{\sin(x)}{\cos(x)} \quad \cot(x) \equiv \frac{\cos(x)}{\sin(x)}$$

Relations cofonctions

$$\sin\left(\frac{\pi}{2} - t\right) \equiv \cos(t) \quad \cos\left(\frac{\pi}{2} - t\right) \equiv \sin(t)$$

$$\tan\left(\frac{\pi}{2} - t\right) \equiv \cot(t) \quad \cot\left(\frac{\pi}{2} - t\right) \equiv \tan(t)$$

$$\sec\left(\frac{\pi}{2} - t\right) \equiv \csc(t) \quad \csc\left(\frac{\pi}{2} - t\right) \equiv \sec(t)$$

Relations pythagoriciennes

$$\sin^2(t) + \cos^2(t) \equiv 1$$

$$1 + \tan^2(t) \equiv \sec^2(t)$$

$$1 + \cot^2(t) \equiv \csc^2(t)$$

Triangle obliquangle (triangle acutangle ou triangle obtusangle)

Loi des sinus

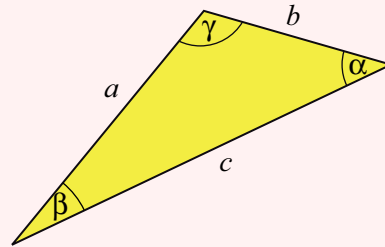
$$\frac{\sin(\alpha)}{a} = \frac{\sin(\beta)}{b} = \frac{\sin(\gamma)}{c}$$

Loi des cosinus

$$a^2 = b^2 + c^2 - 2bc \cos(\alpha)$$

$$b^2 = a^2 + c^2 - 2ac \cos(\beta)$$

$$c^2 = a^2 + b^2 - 2ab \cos(\gamma)$$



Diverses mesures d'angles

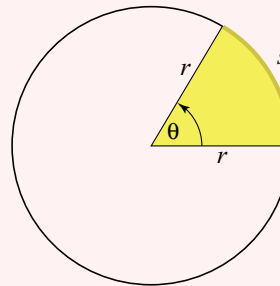
$$\pi \text{ radians} = 180^\circ$$

$$s = r\theta$$

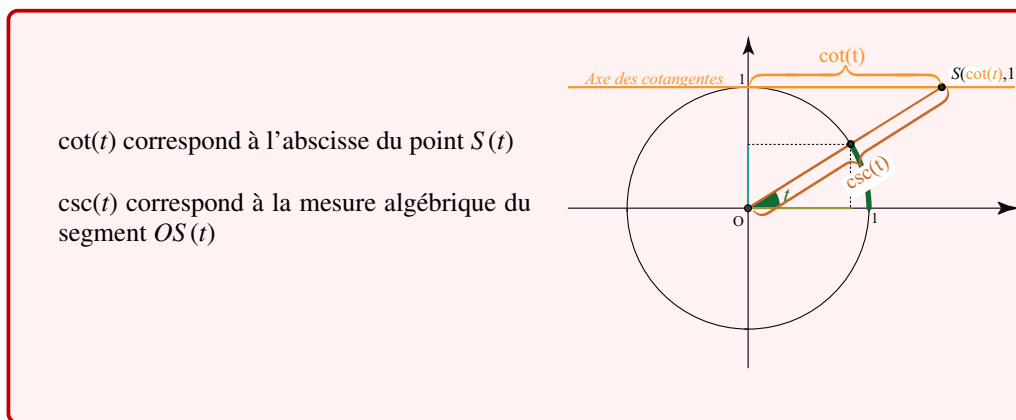
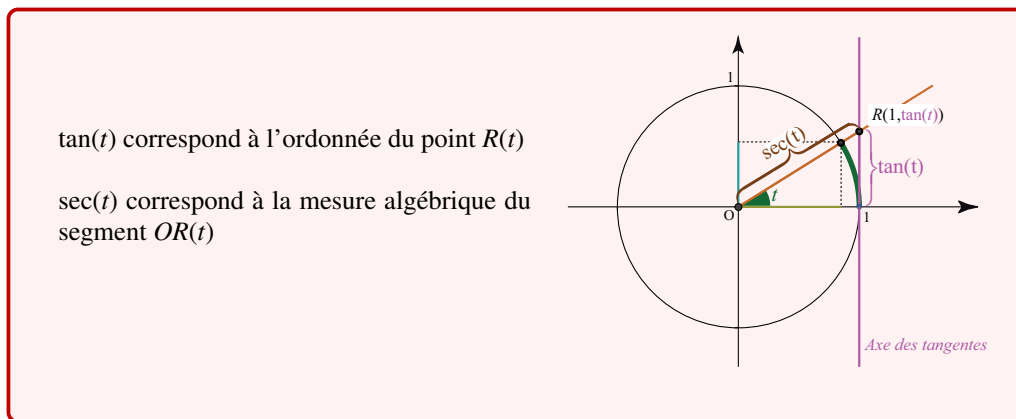
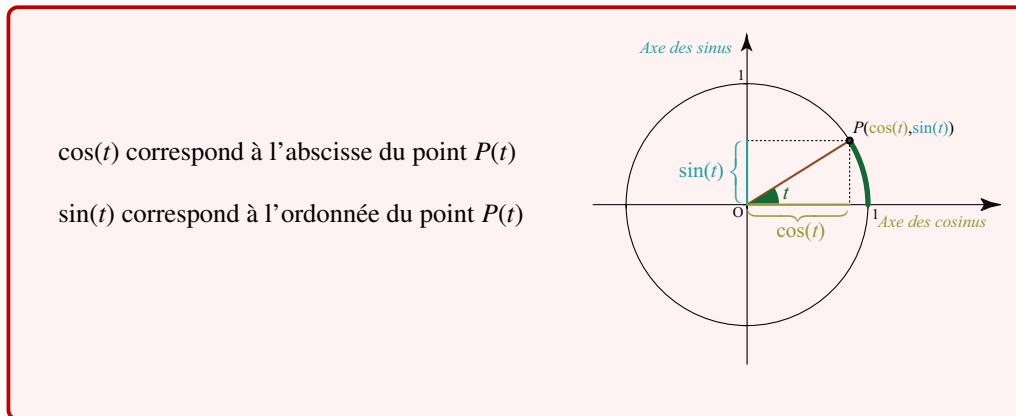
$$A = \frac{1}{2}r^2\theta \quad (\theta \text{ en radians})$$

$$\theta \times \frac{\pi}{180} = \alpha \text{ radians}$$

$$\alpha \text{ radians} \times \frac{180}{\pi} = \theta$$



Trigonométrie circulaire



Remarque: La $\sec(t)$ définie par la mesure algébrique du segment $OR(t)$ correspond à la longueur du segment $OR(t)$ affectée d'un signe positif si le prolongement du segment $OP(t)$ jusqu'à l'axe des tangentes pour obtenir le point d'intersection $R(t)$ s'effectue sans changement de quadrant. Sinon, cette longueur sera affectée d'un signe négatif.

Il en est de même pour la $\csc(t)$.

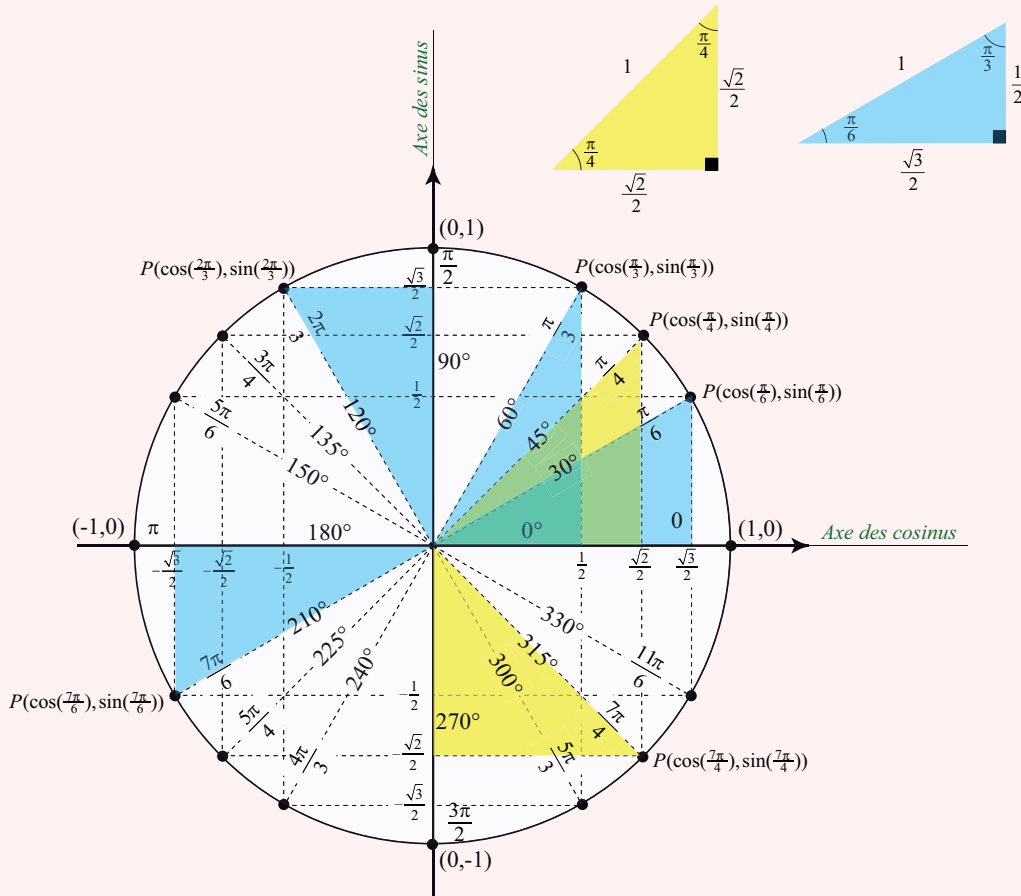
Identités trigonométriques remarquables

$$\text{Identités d'angles composés} \left\{ \begin{array}{l} \sin(u \pm v) \equiv \sin(u) \cos(v) \pm \sin(v) \cos(u) \\ \cos(u \pm v) \equiv \cos(u) \cos(v) \mp \sin(u) \sin(v) \\ \tan(u \pm v) \equiv \frac{\tan(u) \pm \tan(v)}{1 \mp \tan(u) \tan(v)} \end{array} \right.$$

$$\text{Transformation des sommes en produits} \left\{ \begin{array}{l} \sin(u + v) + \sin(u - v) \equiv 2 \sin(u) \cos(v) \\ \sin(u + v) - \sin(u - v) \equiv 2 \cos(u) \sin(v) \\ \cos(u + v) + \cos(u - v) \equiv 2 \cos(u) \cos(v) \\ \cos(u + v) - \cos(u - v) \equiv -2 \sin(u) \sin(v) \end{array} \right.$$

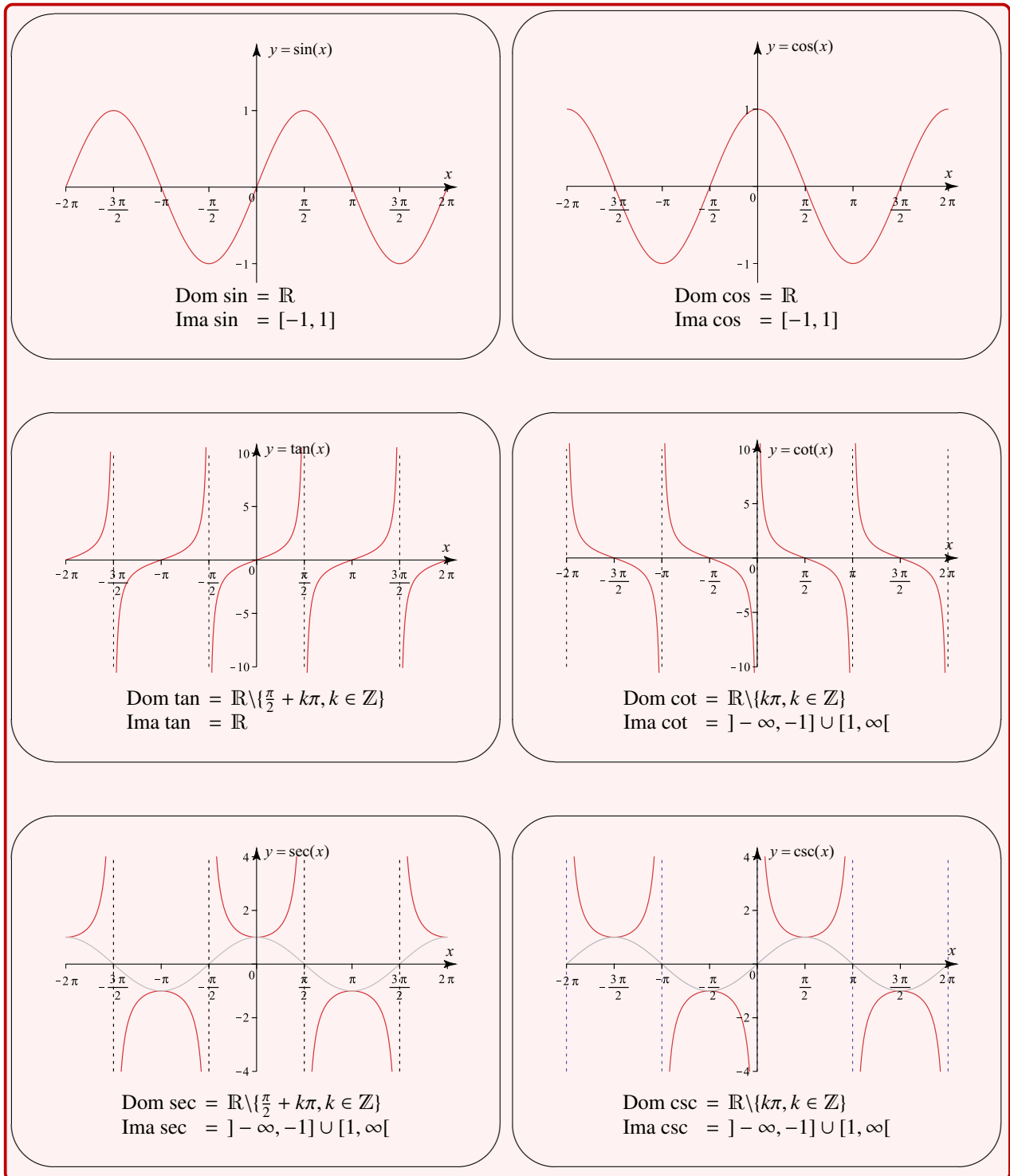
$$\text{Identités d'angles multiples} \left\{ \begin{array}{l} \sin(2t) \equiv 2 \sin(t) \cos(t) \\ \cos(2t) \equiv \cos^2(t) - \sin^2(t) \\ \tan(2t) \equiv \frac{2 \tan(t)}{1 - \tan^2(t)} \\ \sin^2(t) \equiv \frac{1 - \cos(2t)}{2} \\ \cos^2(t) \equiv \frac{1 + \cos(2t)}{2} \\ \sin\left(\frac{t}{2}\right) \equiv \pm \sqrt{\frac{1 - \cos(t)}{2}} \\ \cos\left(\frac{t}{2}\right) \equiv \pm \sqrt{\frac{1 + \cos(t)}{2}} \\ \tan\left(\frac{t}{2}\right) \equiv \frac{\sin(t)}{1 + \cos(t)} \\ \tan\left(\frac{t}{2}\right) \equiv \frac{1 - \cos(t)}{\sin(t)} \end{array} \right.$$

Trigonométrie circulaire et triangles remarquables

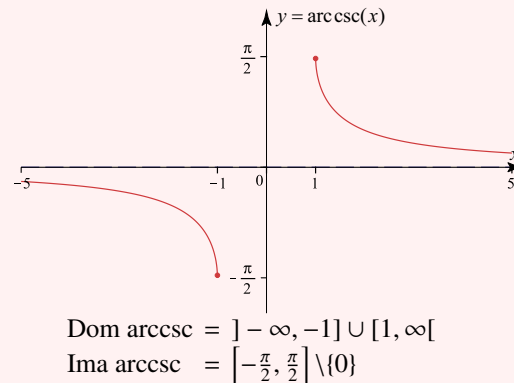
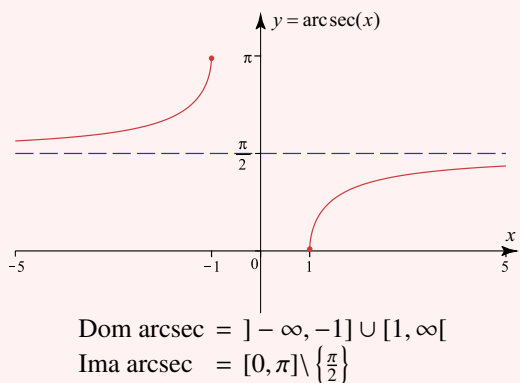
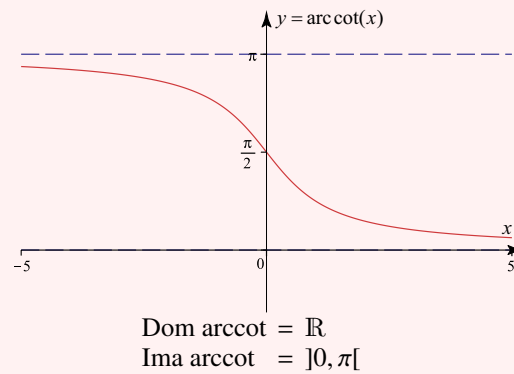
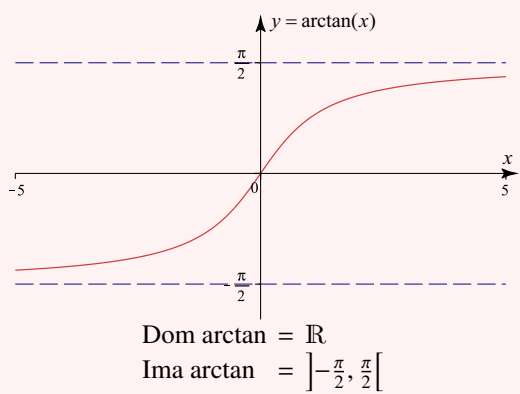
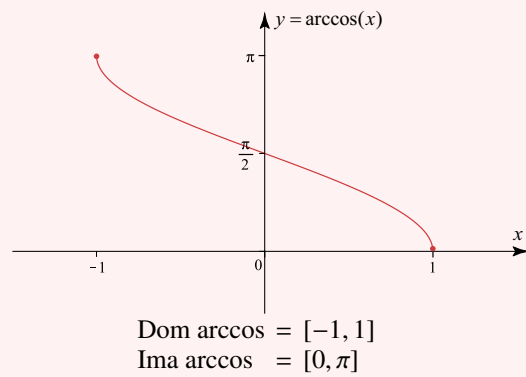
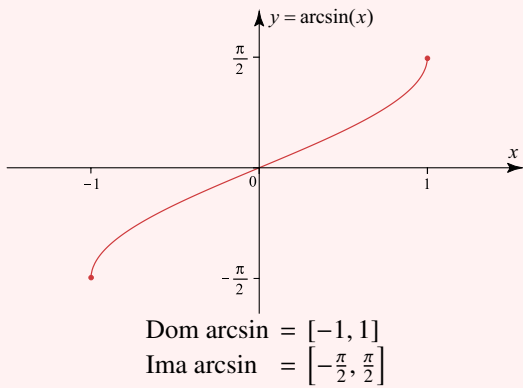


α	0° 0	30° $\frac{\pi}{6}$	45° $\frac{\pi}{4}$	60° $\frac{\pi}{3}$	90° $\frac{\pi}{2}$	180° π	270° $\frac{3\pi}{2}$
$\sin(\alpha)$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1	0	-1
$\cos(\alpha)$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0	1	0
$\frac{\sin(\alpha)}{\cos(\alpha)} = \tan(\alpha)$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$		0	
$\frac{\cos(\alpha)}{\sin(\alpha)} = \cot(\alpha)$		$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0		0
$\frac{1}{\cos(\alpha)} = \sec(\alpha)$	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2		1	
$\frac{1}{\sin(\alpha)} = \csc(\alpha)$		2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$			-1

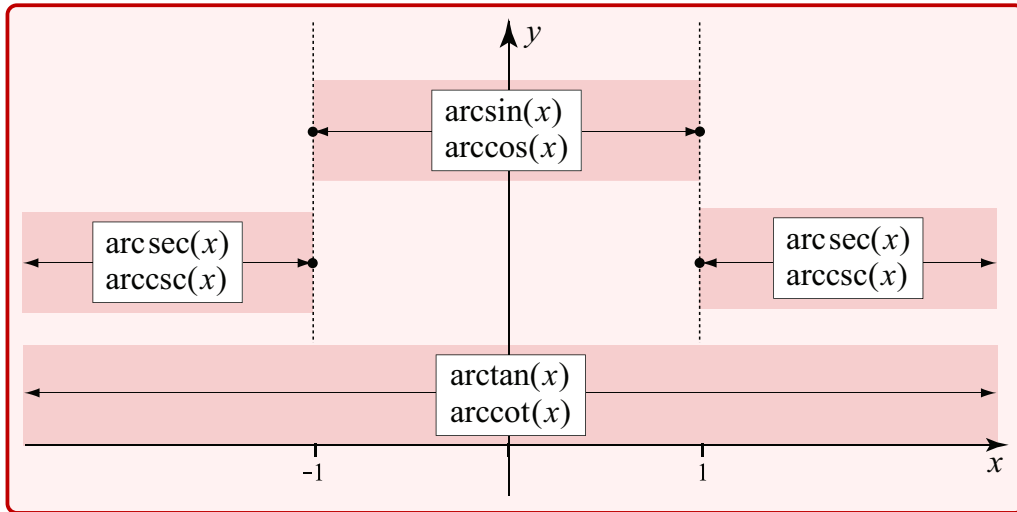
Graphiques des fonctions trigonométriques



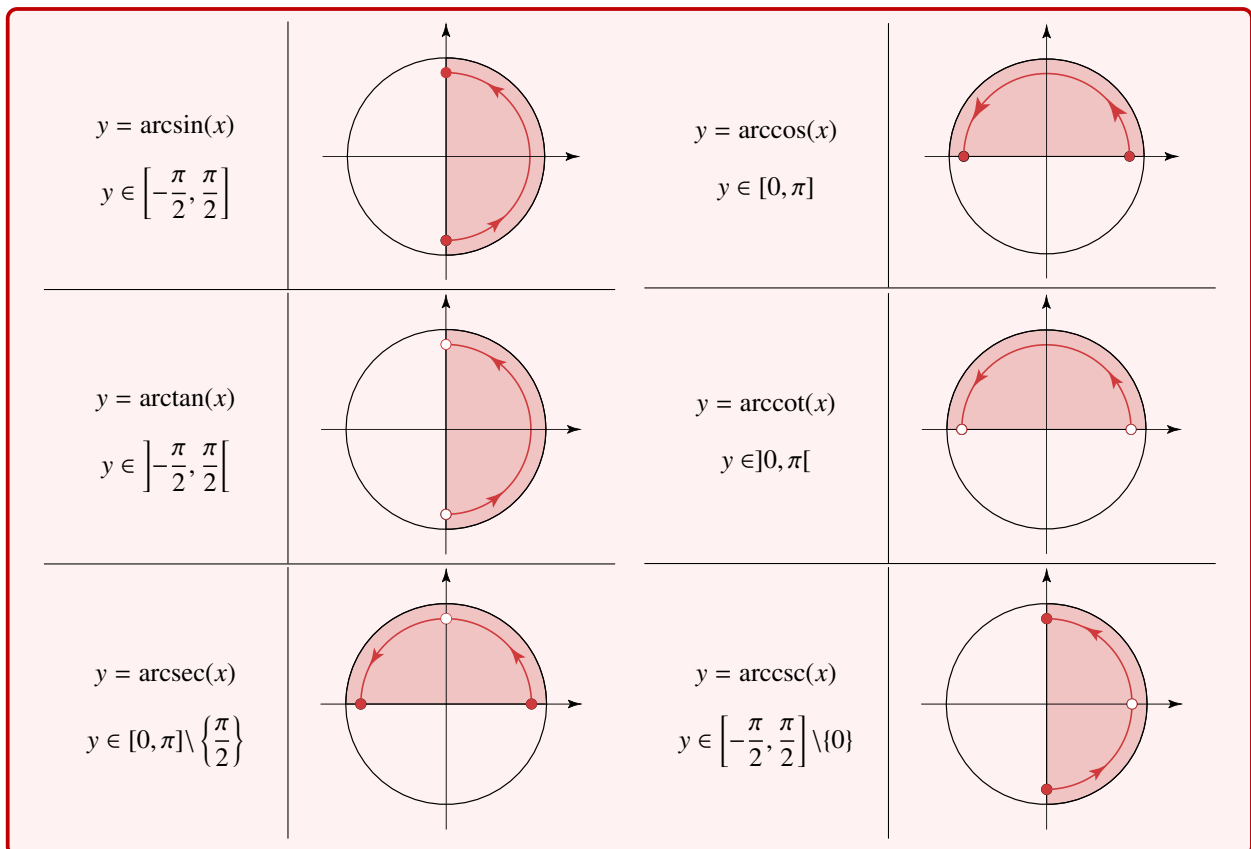
Graphiques des fonctions trigonométriques réciproques



Domaines des fonctions trigonométriques réciproques



Images des fonctions trigonométriques réciproques



Identités des fonctions trigonométriques réciproques

$$\begin{aligned}\sin^{-1}(\sin(x)) &\equiv x && \text{pour } -\frac{\pi}{2} \leq x \leq \frac{\pi}{2} \\ \sin(\sin^{-1}(x)) &\equiv x && \text{pour } -1 \leq x \leq 1\end{aligned}$$

$$\begin{aligned}\cos^{-1}(\cos(x)) &\equiv x && \text{pour } 0 \leq x \leq \pi \\ \cos(\cos^{-1}(x)) &\equiv x && \text{pour } -1 \leq x \leq 1\end{aligned}$$

$$\begin{aligned}\tan^{-1}(\tan(x)) &\equiv x && \text{pour } -\frac{\pi}{2} < x < \frac{\pi}{2} \\ \tan(\tan^{-1}(x)) &\equiv x && \text{pour } -\infty < x < \infty\end{aligned}$$

$$\cot^{-1}(x) \equiv \begin{cases} \tan^{-1}\left(\frac{1}{x}\right), & x > 0; \\ \pi + \tan^{-1}\left(\frac{1}{x}\right), & x < 0. \end{cases}$$

$$\sec^{-1}(x) \equiv \cos^{-1}\left(\frac{1}{x}\right) \quad \text{pour } x \leq -1 \text{ ou } x \geq 1$$

$$\csc^{-1}(x) \equiv \sin^{-1}\left(\frac{1}{x}\right) \quad \text{pour } x \leq -1 \text{ ou } x \geq 1$$