PROPIEDADES DE LAS FUNCIONES INVERSAS

Propiedades

$\text{ArcSen}x + \text{ArcCos}x = \frac{\pi}{2}; \forall\, x \in [-1; 1]$

$\text{ArcTan}x + \text{ArcCot}x = \frac{\pi}{2}; \forall\, x \in \mathbb{R}$

$\text{ArcSec}x + \text{ArcCsc}x = \frac{\pi}{2}; \forall\, x \in \langle -\infty; -1] \cup [1; \infty\rangle$

Para valores negativos:

$\text{ArcSen}(-x) = -\text{ArcSen}x$
$\text{ArcCos}(-x) = \pi - \text{ArcCos}x$
$\text{ArcTan}(-x) = -\text{ArcTan}x$
$\text{ArcCot}(-x) = -\text{ArcCot}x$
$\text{ArcSec}(-x) = \pi - \text{ArcSec}x$
$\text{ArcCsc}(-x) = -\text{ArcCsc}x$

Trabajando en clase

Integral

1. Calcula:

$\theta = \text{ArcSen}\left(-\frac{\sqrt{3}}{2}\right) + \text{ArcCos}\left(-\frac{1}{2}\right)$

2. Si $\text{ArcSen}x + \text{ArcSen}y = \frac{2\pi}{3}$

Calcula: $\theta = \text{ArcCos}x + \text{ArcCos}y$

3. Calcula:

$$Q = \frac{\text{ArcSen}\frac{1}{2} - \text{ArcTan}\left(-\frac{\sqrt{3}}{3}\right)}{\text{Arc Tan}(-1) + \text{ArcCos}\left(-\frac{\sqrt{2}}{2}\right)}$$

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4. Reduce:

$J = \text{Sen}(\text{ArcSen}x + 2\text{ArcCos}x);\ x \in \langle 0; 1\rangle$

Resolución:

$J = \text{Sen}\,[\text{ArcSen}x + \text{ArcCos}x + \text{ArcCos}x]$

$J = \text{Sen}\left[\frac{\pi}{2} + \text{ArcCos}x\right]$

$J = \text{Cos}(\text{ArcCos}x)$
$J = x$

5. Reduce:

$J = (3\text{ArcSen}x + 2\text{ArcCos}x);\ x \in \langle 0; 1\rangle$

6. Resuelve el sistema y halla $\frac{x}{y}$

$\text{ArcSen}(2x + y) = \frac{\pi}{6}$

$\text{ArcTan}(x - 2y) = \frac{\pi}{4}$

7. Determina el valor de x en:

$\text{Arc Cos}(-x) = 4\text{ArcSen}x$

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8. Calcula x si:

$\text{ArcSen}x = \text{ArcCos}x$

Resolución:

Del dato $\text{ArcSen}x = \text{ArcCos}x = \alpha$

$\Rightarrow \text{Sen}\alpha = x$
$\text{Cos}\alpha = x$

Sabemos que:

$\text{ArcSen}x + \text{ArcCos}x = \frac{\pi}{2}$

$\alpha + \alpha = \frac{\pi}{2}$

$\alpha = \frac{\pi}{4}$

$$\Rightarrow \text{Sen}\frac{\pi}{4} = \frac{1}{\sqrt{2}}$$

9. Calcula x, si:
ArcSen2x = ArcCos2x

10. Calcula:

$$M = \frac{\text{ArcSec5} + \text{ArcCsc5}}{\text{ArcCot}\,\frac{1}{4} + \text{ArcTan}\,\frac{1}{4}}$$

11. Calcula:
R = 2(ArcSec3 + ArcCsc3)(ArcTan2 + ArcCot2)

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12. Calcula

$$\theta = \text{ArcSen}\left(\text{Sen}\frac{\pi}{3}\right) + \text{ArcSen}\left(\text{Sen}\frac{2\pi}{3}\right)$$

Resolución:

$$\text{Sen}\frac{2\pi}{3} = \text{Sen}\,\frac{\pi}{3}$$

$$\theta = \text{ArcSen}\left(\text{Sen}\frac{\pi}{3}\right) + \text{ArcSen}\left(\text{Sen}\frac{\pi}{3}\right)$$

$$\theta = \frac{\pi}{3} + \frac{\pi}{3}$$

$$\theta = \frac{2\pi}{3}$$

13. Calcula:

$$\alpha = \text{ArcSen}\left(\text{Sen}\frac{\pi}{5}\right) + \text{ArcSen}\left(\text{Sen}\frac{3\pi}{5}\right)$$

14. Calcula:
β = ArcSen(Sen2) + ArcCos(Cos3)