FUNCIONES INVERSAS

Notación:

- Función seno inverso o función arco Seno: Arc Sen
- Función coseno inverso o función arco coseno. Arc Cos
- Función tangente inversa o función arco tangente: ArcTan
- Función cotangente inversa o función arco cotangente: ArcCot
- Función secante inversa o función arco secante: ArcSec
- Función cosecante inversa o función arco cosecante: Arc Csc

Tener en cuenta:

$$-\frac{\pi}{2} \leq \text{ArcSen } x \leq \frac{\pi}{2}\ ;\ -1 \leq x \leq 1$$

$$0 \leq \text{ArcCos}x \leq \pi\ ;\ -1 \leq x \leq 1$$

$$-\frac{\pi}{2} < \text{ArcTan}x < \frac{\pi}{2};\ -\infty < x < \infty$$

Trabajando en clase

Integral

1. Calcula el valor de:

$\alpha = \text{ArcSen}\dfrac{\sqrt{3}}{2}$

2. Calcula:

$\theta = \text{ArcSen}\dfrac{1}{2} + \text{ArcCos}\dfrac{\sqrt{2}}{2}$

3. Despejar «θ» de:

$\text{Sen}\left(\dfrac{\theta}{3} + \dfrac{\pi}{6}\right) = a$

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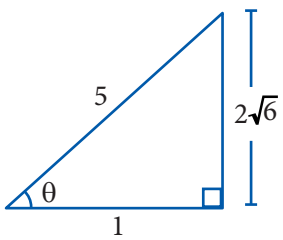
4. Calcula:

$J = \text{Tan}\left(\text{ArcCos}\dfrac{1}{5}\right)$

Resolución:

$\text{Sen}\theta = \text{ArcCos}\dfrac{1}{5}$

$\Rightarrow \text{Cos}\theta = \dfrac{1}{5}$



Nos piden $\text{Tan}\theta = 2\sqrt{6}$

5. Calcula:

$M = \text{Sen}\left(\text{ArcTan}\dfrac{1}{3}\right)$

6. Si: $\theta = \text{ArcCot}\dfrac{1}{2}$

Calcula: $P = \text{Sen}\theta \cdot \text{Cos}\theta$

7. Si $\alpha = \text{ArcSen}\dfrac{1}{4}$.

Calcula: $\text{Sen}2\alpha$

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8. Calcula:

$C = Sen(ArcCot3 + ArcTan\frac{1}{2})$

Resolución:

Sea: $\alpha = ArcCot3 \Rightarrow Cot\alpha = 3$

$\beta = ArcTan\frac{1}{2} \Rightarrow Tan\beta = \frac{1}{2}$

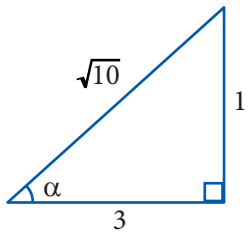
Nos piden:

$C = Sen(\alpha + \beta)$

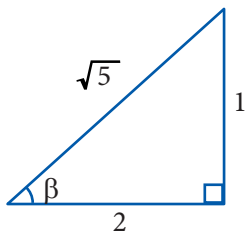
$C = Sen\alpha\, Cos\beta + Cos\alpha\, Sen\beta$

Sabemos:

❖ $Cot\alpha = 3 \Rightarrow$



❖ $Tan\beta = \frac{1}{2} \Rightarrow$



reemplazando:

$C = \frac{1}{\sqrt{10}} \cdot \frac{2}{\sqrt{5}} + \frac{3}{\sqrt{10}} \cdot \frac{1}{\sqrt{5}}$

$C = \frac{5}{5\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{5}}{2}$

9. Simplifica:

$R = Sen\left[ArcCot\left(\frac{5}{12}\right) - ArcCos\left(\frac{3}{5}\right)\right]$

10. Calcula

$M = Tan\left[ArcTan\frac{1}{5} + ArcTan\frac{1}{3}\right]$

11. Calcula:

$Cos\left\{\frac{1}{2}\, ArcCot\left(\frac{3}{4}\right)\right\}$

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12. Reduce:

$J = \frac{Sec^2(ArcTanx) - Csc^2(ArcCoty)}{Sen(ArcSenx) - Cos(ArcCosy)}$

Resolución:

Sea: $\alpha = ArcSenx \Rightarrow Sen\alpha = x$

$\beta = ArcCosy \Rightarrow Cos\beta = y$

También:

$Sec^2(ArcTanx) = 1 + Tan^2(ArcTanx)$

$= 1 + [Tan(ArcTanx)]^2$

$= 1 + x^2$

$Csc^2(ArcCoty) = 1 + Cot^2(ArcCoty)$

$= 1 + [Cot(ArcCoty)]^2$

$= 1 + y^2$

Reemplazando

$J = \frac{1 + x^2 - (1 + y)^2}{x - y}$

$J = \frac{x^2 - y^2}{x - y} = \frac{(x + y)(x - y)}{x - y}$

$\Rightarrow J = x + y$

13. Reduce:

$J = \frac{Tan^2(ArcSecx) - Cot^2(ArcCscy)}{Sen(ArcSenx) + Cos(ArcCosy)}$

14. Calcula:

$J = Cos\left\{ArcCos\left[Tan\left(ArcTan\frac{1}{4}\right)\right]\right\}$