

## I. E. S. " SAN ISIDRO

Calificación

\*2 lim Ln(sen \(\frac{\times}{2}\). sen(n\(\times\) = 0

IND Aplicamos la  $\lim_{x\to 0+} Ln(sen \frac{x}{2}) - sen(nx) = \lim_{x\to 0+} \frac{Ln(sen \frac{x}{2})}{1}$ V Regle de L'Hopital

 $= \lim_{x \to 0^{+}} \frac{(os \frac{x}{2})}{sen \frac{x}{2}} = \lim_{x \to 0^{+}} \frac{1}{2n} \frac{sen^{2}(nx) \cdot (os \frac{x}{2})}{sen^{2}(nx)}$   $= \lim_{x \to 0^{+}} \frac{1}{2n} \frac{sen^{2}(nx) \cdot (os \frac{x}{2})}{sen^{2}(nx)}$ O IND Aplicana 1 L'Hôpital.

=  $\lim_{x \to o^{+}} \frac{1}{2n} \cdot \frac{2n \operatorname{sen}(nx) \operatorname{cos}(nx) \cdot \operatorname{cos}(\frac{x}{2}) + \operatorname{sen}(nx) \cdot (-\operatorname{sen}(\frac{x}{2}) \cdot \frac{1}{2}}{\operatorname{cos}(\frac{x}{2}) \cdot \frac{1}{2}}$ 

\*3  $\int_{-\infty}^{\pi} co \left( \frac{1}{2} \right) \cdot se_n \ln x \right) dx = TT$ 

Para probar esto hay que ver que  $1+2\sum_{k=1}^{n} cos(kx) = \frac{sen(n+\frac{1}{2})x}{sen \frac{x}{2}}$ 

Asumiendo que esto es ciento

 $1 + 2 \frac{\sum_{k=1}^{n} cos(kx)}{\sum_{k=1}^{n} cos(kx)} = \frac{Sen(h+\frac{1}{2})x}{Sen x_{2}} = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen x_{2}} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) sen \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) cos \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2} + cos(nx) cos \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) cos \frac{x}{2}\right) = \frac{1}{Sen(nx)} \cdot \left(Sen(nx) co$ 

= Sen(nx) coty x + cos(nx)

=> coty(x) zen(nx) = 1+2 \(\frac{1}{2}\) cos(ux) + cos(nx).