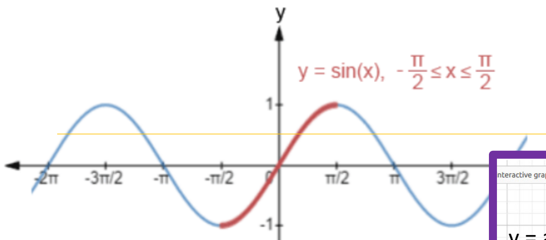
Arcsin

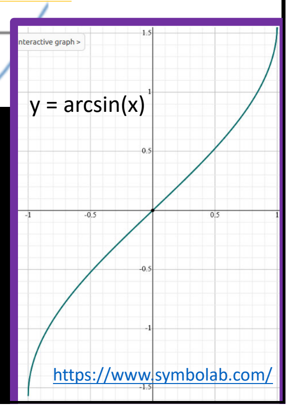
https://www.math.net/arcsin

Arcsine, written as arcsin or $\sin^{-1}$ (not to be confused with $\frac{1}{sin(x)}$), is the inverse sine function. Sine only has an inverse on a restricted domain, $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$. In the figure below, the portion of the graph highlighted in red shows the portion of the graph of sin(x) that has an inverse.



Ex: If sin(x) = 0,
then x = arcsin(0) + kπ = kπ

Ex: If sin(x) = 1/2, then since arcsin(1/2) = π/6
x = π/6 + 2πk = arcsin(1/2) + 2πk or
x = 5π/6 + 2πk = (arcsin(1/2) + 4π/6) + 2πk
= (π - π/6) + 2πk = (π - arcsin(1/2)) + 2πk



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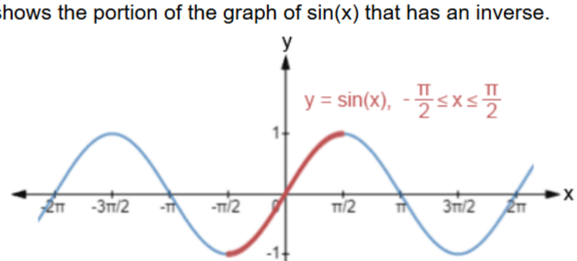

If sin(x) = z, then

x = arcsin(z) + 2πk or x = (π - arcsin(z)) + 2πk

Note: you have sin(ay), not sin(x).

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