Question

The following graph depicts which inverse trigonometric function?
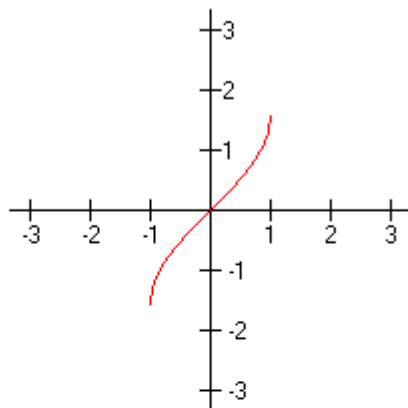
○ $y = Arccos\ x$

○ $y = Arcsin\ x$

○ $y = Arctan\ x$

○ $y = Arcsec\ x$

Solution

1. $y = Arccos(x)$

Arccosine ($y = Arccos x$) is the function inverse to the cosine ($x = \cos(y)$). It has the domain $-1 \leq x \leq 1$ and the range $0 \leq y \leq \pi$.

2. $y = Arcsin(x)$

Arcsine ($y = arcsin x$) is the inverse function of the sine ($x = \sin(y)$). It has the domain $-1 \leq x \leq 1$ and the range $-\pi/2 \leq y \leq \pi/2$.

3. $y = Arctan(x)$

The arctangent ($y = arctan x$) is a function inverse to the tangent ($x = tan(y)$), which has a domain $-\infty < x < +\infty$ and the range $-\pi/2 \leq y \leq \pi/2$.

4. $y = Arcsec(x)$

$y = arcsec(x) = \arccos(1/x)$

Arc secant is discontinuous function defined on entire real axis except the $(-1, 1)$, so its domain is $(-\infty, -1] \cup [1, +\infty)$.

Answer: y=Arcsin (x).