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$$(ii) k(x) = \sec x - \cos x$$

$$k(x) = \frac{1}{\cos x} - \cos x$$

$$k(x) = \frac{1 - \cos^2 x}{\cos x}$$

$$k(x) = \frac{\sin^2 x}{\cos x} = \tan x \sin x, \cos x \neq 0$$

**Part C**

Select a point value to view scoring criteria, solutions, and/or examples to score the response.



0	1	2
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The student response includes both of these criteria.

- $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$
- Input value

**Model Solution**

$$m(x) = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right) \Rightarrow 2\tan^{-1}(\sqrt{3}\pi x) = \frac{\pi}{3}$$

$$\tan^{-1}(\sqrt{3}\pi x) = \frac{\pi}{6}$$

$$\sqrt{3}\pi x = \tan\left(\frac{\pi}{6}\right)$$

$$\sqrt{3}\pi x = \frac{1}{\sqrt{3}}$$

$$x = \frac{1}{3\pi}$$

**Directions:**

- Unless otherwise specified, the domain of a function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number. Angle measures for trigonometric functions are assumed to be in radians.
- Solutions to equations must be real numbers. Determine the exact value of any expression that can be obtained without a calculator. For example,  $\log_2 8$ ,  $\cos\left(\frac{\pi}{2}\right)$ , and  $\sin^{-1}(1)$  can be evaluated without a calculator.
- Unless otherwise specified, combine terms using algebraic methods and rules for exponents and logarithms, where applicable. For example,  $2x + 3x$ ,  $5^2 \cdot 5^3$ ,  $\frac{x^5}{x^2}$ , and  $\ln 3 + \ln 5$  should be rewritten in equivalent forms.
- For each part of the question, show the work that leads to your answers.