

CLASS QUIZ: JANUARY 7: INVERSE TRIGONOMETRIC FUNCTIONS

MATH 153, SECTION 55 (VIPUL NAIK)

Your name (print clearly in capital letters): _____

- (1) What is the domain of $\arcsin \circ \arcsin$? Here, *domain* refers to the maximal possible subset of \mathbb{R} on which the function is defined.
- (A) $[-1, 1]$
 - (B) $[-\sin 1, \sin 1]$
 - (C) $[-\arcsin 1, \arcsin 1]$
 - (D) $[-\sin(2/\pi), \sin(2/\pi)]$
 - (E) $[-\arcsin(2/\pi), \arcsin(2/\pi)]$

Your answer: _____

- (2) Suppose f is a polynomial with degree at least one and positive leading coefficient. Consider the function $g(x) := \arctan(f(x))$. What can we say about the horizontal asymptotes of the graph $y = g(x)$?
- (A) The horizontal asymptote is $y = \pi/2$ both for $x \rightarrow +\infty$ and for $x \rightarrow -\infty$, regardless of f .
 - (B) The horizontal asymptote is $y = \pi/2$ for $x \rightarrow +\infty$ and $-\pi/2$ for $x \rightarrow -\infty$, regardless of f .
 - (C) The horizontal asymptote is $y = \pi/2$ for $x \rightarrow +\infty$, and as $x \rightarrow -\infty$, it is $y = \pi/2$ if f has even degree and $y = -\pi/2$ if f has odd degree.
 - (D) The horizontal asymptote is $y = f(\pi/2)$ both for $x \rightarrow +\infty$ and for $x \rightarrow -\infty$.
 - (E) The horizontal asymptote is $y = f(\pi/2)$ for $x \rightarrow +\infty$ and as $x \rightarrow -\infty$, it is $y = f(\pi/2)$ if f has even degree and $y = f(-\pi/2)$ if f has odd degree.

Your answer: _____

- (3) Consider the function $f(x) := \arcsin(\sin x)$ on the domain $[\pi/2, 3\pi/2]$. Which of the following is $f(x)$ equal to on that domain?
- (A) $\pi + x$
 - (B) $\pi - x$
 - (C) $x - \pi$
 - (D) $(3\pi/2) - x$
 - (E) $x - (\pi/2)$

Your answer: _____

- (4) Consider the function $f(x) := \arccos(\sin x)$ on all of \mathbb{R} . What can we say about the function f ?
- (A) f is periodic, continuous, and piecewise linear.
 - (B) f is periodic and continuous but is not piecewise linear.
 - (C) f is continuous and piecewise linear but not periodic.
 - (D) f is periodic but not continuous.
 - (E) f is continuous but not periodic or piecewise linear.

Your answer: _____