CLASS QUIZ: JANUARY 6: 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. *Last year:* 18/28 *correct*
(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 $y = g(x)$? *Last year:* 22/28 *correct*
(A) The horizontal asymptote is $y = \pi/2$ both for $x \to +\infty$ and for $x \to -\infty$, regardless of f.
(B) The horizontal asymptote is $y = \pi/2$ for $x \to +\infty$ and $-\pi/2$ for $x \to -\infty$, regardless of f.
(C) The horizontal asymptote is $y = \pi/2$ for $x \to +\infty$, and as $x \to -\infty$, 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 $x \to +\infty$ and for $x \to -\infty$.
(E) The horizontal asymptote is $y = f(\pi/2)$ for $x \to +\infty$ and as $x \to -\infty$, 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? *Last year:* 20/28 *correct*
(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? *Last year:* 21/28 *correct*
(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: ____________________________