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Name:

I.D. Number:

Question One: [22 points] Choose the correct answer and fill your answers in the table provided.

Question	01	02	03	04	05	06	07	08	09	10	11
Answer											

- The **domain** of the function $f(x) = \sqrt[3]{5-x} + \ln x$ is:
(A) $(0, \infty)$ (B) $(-\infty, 5]$ (C) $[5, \infty)$ (D) $(0, 5]$ (E) None
- The **domain** of the function $f(x) = \tan^{-1}(x)$ is:
(A) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (B) $\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$ (C) $(-\infty, \infty)$ (D) $(0, \pi)$ (E) $[0, \pi]$
- The **value** of the $\lim_{x \rightarrow -1} \frac{x^3 - x}{x + 1}$ is:
(A) -1 (B) 1 (C) -2 (D) 2 (E) (A) D.N.E
- $\sin(\cos^{-1} x) =$:
(A) $\frac{\sqrt{x^2 - 1}}{x}$ (B) $\frac{x}{\sqrt{x^2 - 1}}$ (C) $\frac{1}{\sqrt{x^2 - 1}}$ (D) $\sqrt{x^2 - 1}$ (E) $\sqrt{1 - x^2}$
- The **inverse** of the function $f(x) = \log_2(x + 1)$ is:
(A) $f^{-1}(x) = 2^{(x-1)}$ (B) $f^{-1}(x) = 2^x - 1$ (C) $f^{-1}(x) = 2^{(x+1)}$ (D) $f^{-1}(x) = 2^x + 1$
(E) $f^{-1}(x) = 2^x$

6. The **solution set** for the equation is $\log_2 x + \log_2(x - 7) = 3$ is:

- (A) $\{-1, 8\}$ (B) $\{8\}$ (C) $\{-1, 9\}$ (D) 9 (E) None

7. If $f(x) = \frac{x}{x-1}$ and $g(x) = x^2 - 1$. Then $(f \circ g)(2) =$:

- (A) 2 (B) 3 (C) $\frac{3}{2}$ (D) $\frac{2}{3}$ (E) None

8. The value of $\sin^{-1}\left(\sin\left(\frac{7\pi}{3}\right)\right)$ is:

- (A) $\frac{\pi}{6}$ (B) $\frac{-\pi}{3}$ (C) $\frac{\pi}{3}$ (D) $\frac{-\pi}{6}$ (E) $\frac{7\pi}{3}$

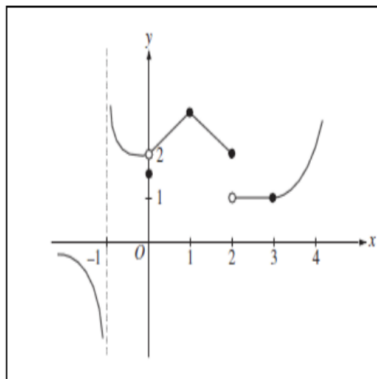
9. Suppose that $\log_{10} 3 = a$ and $\log_{10} 2 = b$. Then $\log_{10} 5 =$:

- (A) $1 - a$ (B) $1 - b$ (C) $a + b$ (D) $a - b$ (E) None

10. One of the following statements is **true** :

- (A) The domain of the function $f(x) = e^{-\sqrt{x-1}}$ is $x > 1$.
(B) $\sec^{-1}(\sqrt{2}) = \frac{-\pi}{4}$ (C) The function $f(x) = x \sin(x)$ is even.
(D) The range of the function $f(x) = 2 \sin^{-1}(x)$ is $[-2, 2]$.
(E) The function $f(x) = |x|$ has an inverse.

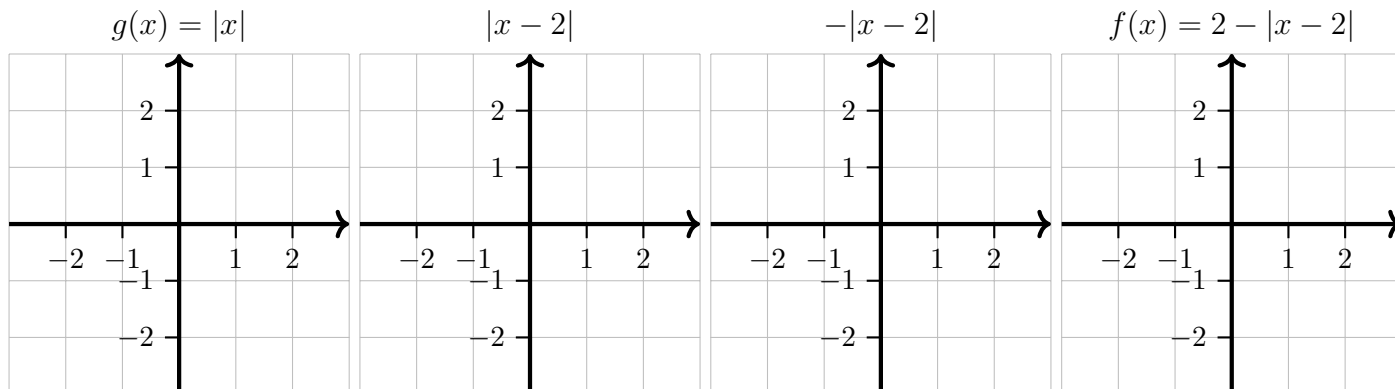
11. The graph of the function $f(x)$ shown below. Find $\lim_{x \rightarrow 0} f(x)$:



- (A) 0 (B) $\frac{3}{2}$ (C) 2 (D) 1 (E) ∞

Question Two: [8 points (4+4)]

1. Draw the function $f(x) = 2 - |x - 2|$ by reflecting (translating) the function of $g(x) = |x|$.



2. Evaluate the following limit $\lim_{x \rightarrow 0} \left(\ln e^{-2} + \frac{\sqrt{x+4} - 2}{x} \right)$

Good Luck