PRACTICE SHEET – MATH 101

Question One: Find the domain of the following functions:

1. $f(x) = \sqrt{x^2 + x - 2}$. **2.** $f(x) = \dfrac{x}{|x-1| - 4}$. **3.** $f(x) = \sqrt{\dfrac{1}{x} - x}$.

Ans. 1. $(-\infty, -2] \cup [1, \infty)$ **2.** $\mathbb{R} - \{-3, 5\}$ **3.** $(-\infty, -1] \cup (0, 1]$.

Question Two: Find the value of :

1. $\tan^{-1}(\tan(\frac{5\pi}{3}))$. **2.** $\tan(\cos^{-1}(\frac{3}{7}))$.

Ans. 1. $\frac{-\pi}{3}$ **2.** $\frac{\sqrt{40}}{3}$

Question Three:

1. If $f(x) = \sqrt{4 - 2x}$ and $g(x) = \sqrt{x} - 1$. Find the domain of $\left(\dfrac{f}{g}\right)(x)$.
2. If $f(x) = x^3 + 3x - 1$, find $f^{-1}(-1)$.
3. If $f(x) = \dfrac{1}{x-2}$ and $g(x) = \sqrt{x-1}$. Find the domain of $(g \circ f)(x)$ and $(f \circ g)(x)$.

Ans. 1. $[0, 1) \cup (1, 2]$ **2.** 0 **3.** $(2, 3]$ and $[1, 5) \cup (5, \infty)$.

Question four: Let $f(x) = \frac{2x-1}{2+x}$, $x \neq -2$. Find $f^{-1}(x)$.

Ans. 1. $f^{-1}(x) = \frac{2x+1}{2-x}$

Question five: Choose the correct answer and fill your answers in the table provided.

Question	**01**	**02**	**03**
Answer	C	D	B

1. You can obtain the graph of $g(x) = (x-3)^2 - 2$, from $f(x) = x^2$ by **:**

   (A) translating 3 units left and 2 units up **(B)** translating 3 units right and 2 units up
   (C) translating 3 units right and 2 units down **(D)** translating 2 units left and 3 units up
   (E) None

2. One of the following sentences is true **:**

   (A) In general $g \circ f = f \circ g$ **(B)** The function $\sec^{-1}(x) = \frac{1}{\cos^{-1}(x)}$ **(C)** $\sin^{-1}(\frac{\sqrt{3}}{2}) = \frac{2\pi}{3}$
   (D) Domain$f^{-1}(x)$ =Range$f(x)$ **(E)** The function $y = x^2$ is one to one.

3. If $g(x) = \frac{x}{x-1}$ and $f(x) = \begin{cases} x^2 - 1 & n \leq 2 \\ 2 + \sqrt{x} & x > 2 \end{cases}$, then $f \circ g(\frac{4}{3}) =$ **:**

   (A) 3 **(B)** 4 **(C)** 8 **(D)** 5 **(E)** None.