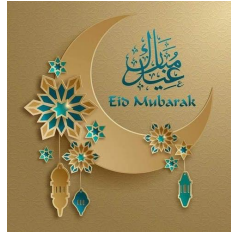




Practice Sheet 2 – Math 101



Question One: Find the domain of the following functions:

1. $f(x) = \frac{\ln(1-x)}{\sqrt{4-x^2}}$.

2. $f(x) = \frac{5}{\ln(x+1)} - 2$

3. $f(x) = 2^x + x + 1$.

Ans. 1. $(-2, 1)$, **2.** $(-1, e^2 - 1) \cup (e^2 - 1, \infty)$, **3.** \mathbb{R} .

Question Two: Rewrite the following expression as a single logarithm

1. $4 \log_{10} 2 - \log_{10} 3 + \log_{10} 9$

2. $2 \ln(x+1) + \frac{1}{3} \ln(x) - \ln(\cos(x))$.

Ans.1. $\log_{10} 48$ **2.** $\ln\left(\frac{(x+1)^2 \sqrt[3]{x}}{\cos(x)}\right)$.

Question Three: Solve for x :

1. $\log_3(3^x) = 7$

Ans. $x = 7$

2. $\ln(x - \sqrt{3}) + \ln(x + \sqrt{3}) = 0$

Ans. $x = 2$

3. $3^x = 2$

Ans. $x = \log_3 2$

Question four: Find the exact value for the following

1. $\sin(2 \cos^{-1}(\frac{3}{5}))$

Ans. $\frac{24}{25}$

2. $\sin^{-1}(\frac{-1}{\sqrt{2}})$

Ans. $\frac{-\pi}{4}$

3. $\cos^{-1}(\cos \frac{12\pi}{4})$

Ans. $\frac{3\pi}{4}$

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

Question	01	02	03
Answer	A	C	B

1. If $f(x) = \ln(2 - x)$, then the range of $f^{-1}(x)$ is :

- (A) $(-\infty, 2)$ (B) $(2, \infty)$ (C) $(0, \infty)$ (D) \mathbb{R}
(E) None

2. The expression $\ln(x) - 1$ is equivalent to :

- (A) $\ln(x+e)$ (B) $\ln(x-e)$ (C) $\ln(\frac{x}{e})$ (D) $\ln(\frac{e}{x})$
(E) None

3. The range of the function $f(x) = \tan^{-1}(x)$ is :

- (A) $(-1, 1)$ (B) $(\frac{-\pi}{2}, \frac{\pi}{2})$ (C) $(\frac{-\pi}{4}, \frac{\pi}{4})$ (D) $[\frac{-\pi}{2}, \frac{\pi}{2}]$
(E) None.