

The Open University of Sri Lanka
B.Sc/ B.Ed Degree Programme
No Book Test (NBT) - 2023/2024
Pure Mathematics – Level 03
PEU3301 – Foundations of Mathematics



DURATION: ONE HOUR

Date: 28.01.2024

Time: 1.00 p.m. – 2.00 p.m.

ANSWER ALL QUESTIONS.

1. Let $x, y, z \in \mathbb{R}$. Prove that

i. $(-x)(-y) = xy$,

ii. If $x < y$ and $y < z$, then $x < z$.

2. Solve the inequality $\frac{2x-3}{5x-4} \geq 2$ for $x \in \mathbb{R}$.

3. Show that $\sup(1, 3) = 3$.

4.

i. Is $\sqrt{3} + \sqrt{5}$ algebraic? Justify your answer.

ii. Let α be a non-zero algebraic number. Prove that $\left(-\frac{1}{\alpha}\right)$ is an algebraic number.
