MAC 2311 Quiz 2 Lectures 3 - 4

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1. (5 pts) Solve the following equation.

$$\ln(x^3 - 2) = 3$$

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$\Rightarrow e^{\ln(x^3-2)} = e^3$

$\Rightarrow x^3 - 2 = e^3$

$\Rightarrow x^3 = e^3 + 2$

$\Rightarrow \boxed{x = \sqrt[3]{e^3+2}}$

2. (5 pts) Let $f(x) = \frac{1}{x-3}$ and $g(x) = \sqrt{x+1}$. Find the domain of $(f \circ g)(x)$.

Domain of $g(x)$: $x+1 \geq 0 \Rightarrow x \geq -1$

$(f \circ g)(x) = \frac{1}{\sqrt{x+1} - 3}$

$\Rightarrow \sqrt{x+1} - 3 \neq 0$

$\Rightarrow \sqrt{x+1} \neq 3 \Rightarrow x+1 \neq 9 \Rightarrow x \neq 8$

Domain of $(f \circ g)(x)$

$x \geq -1, \ x \neq 8$

$\boxed{x \in [-1, 8) \cup (8, \infty)}$