Precalculus Quiz

Name _____

Professor _____

1. Write as a single interval: $\left]-\infty\,;3\right] \cup \left]2\,;4\right]$.

2. Express the intersection of sets in interval form:

$$\left\{x \in \mathbb{R} : x^2 - x - 6 \leq 0\right\} \cap \left\{x \in \mathbb{R} : \frac{x-1}{x} \geq \frac{2}{3}\right\}.$$

3. Given the functions

$$\begin{array}{rccc} f: & \left]-1\,;4\right] & \to & \mathbb{R} \\ & x & \mapsto & x^2-1 \end{array}$$

and

$$\begin{array}{rccc} g: & \left[-2\,;1\right[& \to & \mathbb{R} \\ & x & \mapsto & \dfrac{x}{x^2+1} \end{array},$$

determine the domains of $f+g$, $f \circ g$ and $g \circ f$.

4. Demonstrate that

$$|x+1| + |x-1| = \begin{cases} -2x & \text{if } x \leq -1 \\ 2 & \text{if } -1 \leq x \leq +1 \\ 2x & \text{if } x \geq +1 \end{cases}$$