Math 181 Honors Quiz 3 Version A

1. Let the sets $A, B, C \subseteq \mathbf{R}$ be given by

$$A = \{\, 1, 2, 3 \,\}, \quad B = \{\, 0, 2, 4 \,\} \quad \text{and} \quad C = \left\{\, \sin 0, \sin \frac{\pi}{6}, \sin \frac{\pi}{3}, \sin \frac{\pi}{2} \,\right\}.$$

Write down the following sets in the form $\{\,$ elements in the set $\,\}$ where each element in the set is listed only once.

(i) $A \cup B$

(ii) $A \cap B$

(iii) $A \setminus B$

(iv) $(A \cup B) \setminus C$

2. Write the following sets as a union of disjoint intervals.

(i) $(0, 4) \cup (1, 2]$

(ii) $(0, 4) \setminus (1, 2]$

(iii) $[\sqrt{2}, 4] \setminus \mathbf{N}$

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3. State the definition of
$$\lim_{x \to x_0} f(x) = L$$
in terms of ϵ and δ.

4. Convert the repeating decimal $3.\overline{26}$ into a fraction.

5. Solve the inequality $\dfrac{x}{x-1} \geq \dfrac{x+1}{x}$.

6. Find the center and radius of the circle $x^2 + y^2 + x - y = 14$.