Problem 1: Let $X_0 = \{z \in \mathbb{Z} : z = 3x \text{ for some } x \in \mathbb{Z}\}$, 
$X_1 = \{z \in \mathbb{Z} : z = 3x + 1 \text{ for some } x \in \mathbb{Z}\}$, $X_2 = \{z \in \mathbb{Z} : z = 3x + 2 \text{ for some } x \in \mathbb{Z}\}$.
Is $\{X_0, X_1, X_2\}$ a partition of $\mathbb{Z}$? Why?

Problem 2: Let $X_3 = \{z \in \mathbb{Z} : z = 3x + 3 \text{ for some } x \in \mathbb{Z}\}$, 
$X_7 = \{z \in \mathbb{Z} : z = 3x + 7 \text{ for some } x \in \mathbb{Z}\}$, $X_{-1} = \{z \in \mathbb{Z} : z = 3x - 1 \text{ for some } x \in \mathbb{Z}\}$.
Is $\{X_3, X_7, X_{-1}\}$ a partition of $\mathbb{Z}$? Why?

Problem 3: Let $Y_0 = \{z \in \mathbb{R} : z = 3x \text{ for some } x \in \mathbb{R}\}$, 
$Y_1 = \{z \in \mathbb{R} : z = 3x + 1 \text{ for some } x \in \mathbb{R}\}$, $Y_2 = \{z \in \mathbb{R} : z = 3x + 2 \text{ for some } x \in \mathbb{R}\}$.
Is $\{Y_0, Y_1, Y_2\}$ a partition of $\mathbb{R}$? Why? (Be careful, this is tricky!)