MATH 450 Seminar in Proof

Let $f : \mathbb{Z} \to 2\mathbb{Z}$ be defined by $f(x) = 2x - 6$. Prove that f is a bijection.

Proof. Let f be the function defined as in the question.
One-to-One: Let $f(x_1) = f(x_2)$, then

$$2x_1 - 6 = 2x_2 - 6 \tag{1}$$

$$2x_1 = 2x_2 \tag{2}$$

$$x_1 = x_1 \quad \text{period} \tag{3}$$

This means that if $f(x_1) = f(x_2)$ then, $x_1 = x_1$ thus f is one-to-one.
Onto: Let $y \in 2\mathbb{Z}$. Let $x = \dfrac{y + 6}{2}$.

$$\underset{\text{Need a transitional word or two}}{} f(x) = 2x - 6$$

$$= 2 \left(\frac{y + 6}{2} \right) - 6 \tag{4}$$

$$= y + 6 - 6$$

$$f(x) = y \quad \text{period} \qquad \text{Have you shown this?}$$

This means that for every $y \in 2\mathbb{Z}$ there exists an $x \in \mathbb{Z}$ such that $x = \dfrac{y + 6}{2}$ and making f onto. Thus f is bijective. $\qquad \square$

This is not the definition of onto lol.
x doesn't always have to be (y+6)/2
for any onto function.