Directions: Answer the problems given below.

1. Rewrite the following statemens into the form ∀_____, _____.

a. Every integer is even or odd.

$$\forall \text{ integer } n, \; n \text{ is even or odd.}$$

b. All whales live in the ocean.

$$\forall \text{ whale } W, \; W \text{ lives in the ocean.}$$

c. The number -1 is not the square of any real number.

$$\forall \text{ real } x, \; x^2 \neq -1.$$

2. Find a counterexample to show the following statement is false:

$$\forall \text{ real numbers } x \text{ and } y, \; \sqrt{x+y} \neq \sqrt{x} + \sqrt{y}.$$

Counterexample: Let $x = 0, \; y = 0$.

Then $\sqrt{0+0} = \sqrt{0} = 0 = 0 + 0 = \sqrt{0} + \sqrt{0}$.