1.

Let A(x,y) be "the sum of even integers x and y" and C(z) be "the double of a integer z". Then for any even integers x, y exist integer z that A(x,y) = C(z).

It is true because there exist integers a and b that x = 2a, y = 2b, A(x,y) = 2a+2b = 2(a+b)

To satisfy the statement, let z = (a+b) so that C(z) = 2(a+b) = A(x,y)

2.

Let A(x,y) be "the sum of odd integers x and y" and C(z) be "the double of a integer z". Then for any even integers x, y exist integer z that A(x,y) = C(z).

It is true because adding two integers up would be an even number, so there could be integer m that 2m = x+y

Thus, let z = m so that C(z) = x+y = A(x,y)

3.

Without loss of generality, assume that a is odd integer so b must be an even integer.

Since there are two odd integers and two even integers, the remaining must be one odd integer and one even integer.

Without loss of generality, assume that c is odd integer, then c+d is odd integer.

The case where assuming c is an integer is similar.