Quiz 3

1. Prove that the difference of two odd integers is even.:

If x and y are odd integers, then $x-y$ is even.

Proof Let x and y be odd integers. Since x, y are odd, there are integers c, d with $x = 2c+1$ and $y = 2d+1$. Therefore

$$x-y = (2c+1)-(2d+1) =$$

$$2c+(-2d-1 = 2c-2d = 2(c-d)$$

is even because c, d integers $\Rightarrow$ $c-d$ is an integer.

$\therefore x-y$ is even. QED

2. (a) Take $x=2$. $x^3-1 = 8-1 = 7$ is not composite.

(b) Take $x=1, y=-2$. then $x^2 < y^2$, but $x < y$ is false.

$1 \quad 4$