$$\therefore L.H.S = R.H.S$$

proved.

(b) let, $u = f(x,y) = ax^2 + 2hxy + by^2$

For testing homogeneous f^n

Replace x by tx and y by tx

$$u = a\,t^2 x^2 + 2h\,t^2 xy + b\,t^2 y^2$$

$$u = t^2(ax^2 + 2hxy + by^2)$$

$$f(tx, tya) = t^2 f(x,y)$$

This shows that the f^n is homogeneous function of degree 2.

$$n = 2.$$