1. Disprove the following:

Every animal with wings is a brid.

2. Give a direct proof of the following:

if $4x^2 - 16x + 16 = 0$, then $x = 2$

3. Give a proof by contrapositive of the following

if $x - 2 > 0$, then $x > 0$ (be very careful!)

4. Give a proof by contradiction of the following:

if $2x^2 - 8x + 8 = 0$, then $x \neq 3$

5. Give an exhaustive proof of the following:

if $0 < x < 5$, then $2x^2 + 1 > 2$

6. Prove by mathematical induction that the following is true. Show all work.

$$1^2 + 2^2 + \cdots + n^2 = \frac{n(n+1)(2n+1)}{6}, \; n \geq 2$$