Problem 3. [2 marks]

Give, with brief justification, an expression for the number of clauses of φ_G in terms of n (the number of vertices of G) and m (the number of edges of G).

For full marks, the number of clauses produced by your `awk` program (`prob2.awk`) must be correct as well as equalling the expression you give here.

Put your answer in a PDF file called `prob3.pdf`.

$\ell_G = 4n + 3m$

so: for each vertex, there exist 4 clauses:

1 determining that v must have a colour
(v black v v Red v v White)

3 determining that it cannot be have more than 1.
(¬v Black v ¬v Red) ... (¬v Black v ¬v White).

for each edge e there exists 3 clauses
3 determining that the edge between vertices do not have same colour