

Homework 3 Problem 3 Solution

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a) Notice how the form of $a^2 + 4ab + 4b^2$ is a bit like $x^2 + 2xy + y^2 = (x + y)^2$. In fact, if we rewrite it as $a^2 + 2a \cdot (2b) + (2b)^2$, we see that its factorization is actually $(a + 2b)^2 = a^2 + 2a \cdot (2b) + (2b)^2$, which you can see by plugging in a for x and $2b$ for y in the above formula.

b) By subtracting $a + 1$ from each side, we see that it is sufficient to prove that $(b - 1) < a(b - 1)$. Since $a > 1$ and $b - 1 > 0$, we indeed have $b - 1 < a(b - 1)$.