## Algebra & Functions (Maths 201–016)

1. Factor completely: $27x^3 - 1$

    **Answer:** The answer to the question originally asked (as above) is: $(3x - 1)(9x^2 + 3x + 1)$
    But I replaced this with $16x^2 - 1$, which factors as $(4x - 1)(4x + 1)$. If you answered the original cubic
    one, I counted it as a bonus question.

2. Solve the equation $x = \sqrt{3x + 16} - 2$ for $x$, or (if appropriate) show that the equation has no solution.

    **Answer:** $x = 3$ (Note that $x = -4$ does not work in the original equation!)

3. Solve the following system *by completing the square*:

    $x^2 - 14x = 1$

    **Answer:** $x = 7 \pm 5\sqrt{2}$

(These questions are from the Dec 2016 exam)