Completion of Squares: Extra Problems

1. Use completion of squares to write the polynomial \( x^2 - 8x - 1 \) in the form \( a(x + b)^2 + c \).
   Answer: \((x - 4)^2 - 17\).

2. Use completion of squares to write the polynomial \( x^2 + x + 1 \) in the form \( a(x + b)^2 + c \).
   Answer: \((x + \frac{1}{2})^2 + \frac{3}{4}\).

3. Use completion of squares to write the polynomial \( x^2 + 5x - 1 \) in the form \( a(x + b)^2 + c \).
   Answer: \((x + \frac{5}{2})^2 - \frac{29}{4}\).

4. Use completion of squares to write the polynomial \( 3x^2 + 6x + 1 \) in the form \( a(x + b)^2 + c \).
   Answer: \(3(x + 1)^2 - 2\).

5. Use completion of squares to write the polynomial \( 2x^2 - x + 2 \) in the form \( a(x + b)^2 + c \).
   Answer: \(2(x - \frac{1}{4})^2 + \frac{15}{8}\).

6. Find all solutions of the equation \( 12(x + 13)^2 - 48 = 0 \).
   Answer: \((x + 13)^2 = 4 \implies x + 13 = \pm 2\). Hence \(x = -11\) or \(x = -15\).

7. Find all solutions of the equation \( 25(9x - 1)^2 - 36 = 0 \).
   Answer: \((9x - 1)^2 = \frac{36}{25} \implies 9x - 1 = \pm \frac{6}{5}\). Hence \(x = \frac{11}{45}\) or \(x = -\frac{1}{45}\).

8. Find all solutions of the equation \( 7(x + 8)^2 - 56 = 0 \).
   Answer: \((x + 8)^2 = 8 \implies x + 8 = \pm 2\sqrt{2}\). Hence \(x = -8 + 2\sqrt{2}\) or \(x = -8 - 2\sqrt{2}\).