

Proving Polynomial Identities

Are the following identities true?

1 $16x^2 - 4 \equiv (4x + 2)(4x - 2)$

2 $36x^2 - 81 \equiv (6x + 9)(6x - 9)$

3 $25x^2 - 121 \equiv (5x + 11)(5x - 11)$

4 $x^2 - 49 \equiv (x + 7)(x - 7)$

5 $9x^2 - \frac{25}{4} \equiv \left(3x + \frac{5}{2}\right)\left(3x - \frac{5}{2}\right)$

6 $9x^2 \equiv \left(3x + \frac{5}{2}\right)\left(3x - \frac{5}{2}\right) + \frac{25}{4}$

7 $6x^2 + 4x + 5 \equiv 6\left(x + \frac{1}{3}\right)^2 + 5 - \frac{2}{3}$

8 $3x^2 + 7x + 5 \equiv 3\left(x + \frac{2}{7}\right)^2 + 3 - \frac{5}{7}$