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POLYNOMIALS ASSIGNMENT NO. 39

1. Simplify: $(a + b + c)^2 + (a - b + c)^2 + (a + b - c)^2$
2. If $x + \frac{1}{x} = 9$, then find the value of $x^3 + \frac{1}{x^3}$
3. Factorise: $4(x^2 + 1)^2 + 13(x^2 + 1) - 12$
4. Factorise: $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$
5. Simplify by factorisation method: $\frac{6 - 2\sqrt{2}x - x^2}{2 - x^2}$
6. Prove that $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2) = 8y^3$
7. If $x^2 + \frac{1}{x^2} = 51$, find the value of
 - (i) $x - \frac{1}{x}$
 - (ii) $x^3 - \frac{1}{x^3}$
8. If $x + \frac{1}{x} = 5$, then evaluate $x^6 + \frac{1}{x^6}$
9. Without actual division, prove that $2x^4 - 8x^3 + 3x^2 + 12x - 9$ is exactly divisible by $x^2 - 4x + 3$.
10. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is divided by $(x - 1)$ and $(x + 1)$, it leaves the remainders 5 and 19 respectively, find the values of a and b .