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## POLYNOMIALS

## ASSIGNMENT NO. 10

1. If $x + \frac{1}{x} = 3$, then find the value of $x^3 + \frac{1}{x^3}$
2. Using Remainder theorem, factorise: $2x^3 - 13x^2 + 26x - 15$
3. Verify that: $xy\left[(x+y)\left(\frac{1}{x}+\frac{1}{y}\right) - 4\right] = (x-y)^2$
4. Assuming that $x, y, z$ are positive real numbers and the exponents are all rational numbers, show that: $\left(\frac{x^a}{x^b}\right)^{a^2+ab+b^2} . \left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2} . \left(\frac{x^c}{x^a}\right)^{c^2+ca+a^2} = 1$
5. If $(x-2)$ and $\left(x - \frac{1}{2}\right)$ are factors of $px^2 + 5x + r$, then show that $p = r$.
6. The polynomial $p(x) = kx^3 + 9x^2 + 4x - 8$ when divided by $(x+3)$ leaves a remainder $10(1-k)$. Find the value of $k$.
7. If $x$ and $y$ are two positive real numbers such that $8x^3 + 27y^3 = 730$ and $2x^2y + 3xy^2 = 15$, then evaluate $2x + 3y$.
8. Examine whether $(x+1)$ is a factor of $3x^2 + x - 1$?
9. If $x$ and $y$ are two positive real numbers such that $x^2 + 4y^2 = 17$ and $xy = 2$, then find the value of $(x + 2y)$.
10. If $(x-a)$ is the factor of $3x^2 - mx - na$, then prove that $a = \frac{m+n}{3}$.