ST. THOMAS SCHOOL
CLASS - IX SUBJECT – MATHEMATICS
HOLIDAY HOMEWORK
WORKSHEET –3 POLYNOMIALS (2020 – 21)

(Note: All questions to be done in A4 size sheets/loose sheets/ruled sheets/or in a separate notebook)

Q1 Factorise the following :
(i) $2x^2 - 7x - 15$
(ii) $25x^2 + 9y^2 + 9z^2 - 30xy - 18yz + 30xz$
(iii) $x^3 - 6x^2 + 11x - 6$

Q2. Expand the following using suitable identities
(i) $(3a - 5b - c)^2$
(ii) $(3a - 2b)^3$
(iii) $(\frac{3}{2}x + 1)^3$

Q3. Let R_1 and R_2 are the remainders when polynomial $f(x) = 4x^3 + 3x^2 - 12ax - 5$ and $g(x) = 2x^3 + ax^2 - 6x - 2$ are divided by (x-1) and (x-2) respectively. If $3R_1 + R_2 - 28 = 0$, Find the value of a.

Q4. Using factor theorem factorise $x^4 + x^3 - 7x^2 - x + 6$

Q5. Find m and n , if (x + 2) and (x + 1) are the factors of $x^3 + 3x^2 - 2mx + n$.

Q6. If $p(x) = x^2 - 4x + 3$, evaluate $p(2) - p(-1) + p\left(\frac{1}{2}\right)$

Q7. If x + y + z = 1 , xy + yz + zx = -1 and xyz = -1, find the value of $x^3 + y^3 + z^3$

Q8. Factorise $4x^2 + y^2 + 25z^2 + 4xy - 10yz - 20zx$ and hence find its value when x = -1, y = 2 and z = -3

Q9. If $a^2 + \frac{1}{a^2} = 18$, find the value of $a^3 - \frac{1}{a^3}$, using only the positive value of $a - \frac{1}{a}$.

Q10. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$, so that the result is exactly divisible by $2x^2 + x - 1$?

Q11. If p = 5 – x, prove that: $x^3 + 15px + p^3 - 125 = 0$

Q12. If $x^2 - 3x + 2$ is a factor of $x^4 - ax^2 + b$, then find a and b.

Q13. Factorise $3x^3 - x^2 - 3x + 1$ using factor theorem and long division.

Q14. Factorise: (i) $343a^3 - 729b^3$ (ii) $25x^3y - 121xy^3$

Q15. Without actually calculating the cubes find the value of
i) $1.5^3 - 0.9^3 - 0.6^3$ ii) $30^3 + 20^3 - 50^3$

Q.16 Using factor theorem factorise $x^4 + x^3 - 7x^2 - x + 6$