

Grade 11 Methods Lesson 1

Division of partial fractions

18. a. **WE6** Calculate the quotient and the remainder when $(x - 12)$ is divided by $(x + 3)$.
- b. Use the inspection method to obtain $\frac{4x + 7}{2x + 1}$.

Polynomial long division

19. a. **WE7** Given $P(x) = 2x^3 - 5x^2 + 8x + 6$, divide $P(x)$ by $(x - 2)$ and state the quotient and the remainder.
- b. Use the long-division method to calculate the remainder when $(x^3 + 10)$ is divided by $(1 - 2x)$.

Remainder theorem

6. a. **WE14** Show that $(x - 2)$ is a factor of $Q(x) = 4x^4 + 4x^3 - 25x^2 - x + 6$.
- b. Determine the polynomial $P(x) = 3x^3 + ax^2 + bx - 2$ which leaves a remainder of -22 when divided by $(x + 1)$ and is exactly divisible by $(x - 1)$.
13. Fully factorise the following.
- a. $x^3 + 5x^2 + 2x - 8$
 - b. $x^3 + 10x^2 + 31x + 30$
 - c. $2x^3 - 13x^2 + 13x + 10$
12. a. Given $(x - 4)$ is a factor of $P(x) = x^3 - x^2 - 10x - 8$, fully factorise $P(x)$.
- b. Given $(x + 12)$ is a factor of $P(x) = 3x^3 + 40x^2 + 49x + 12$, fully factorise $P(x)$.

Equating Polynomial factors

10. a. If $P(x) = 4x^3 + kx^2 - 10x - 4$ and $P(1) = 15$, obtain the value of k .
- b. If $Q(x) = ax^2 - 12x + 7$ and $Q(-2) = -5$, obtain the value of a .
- c. If $P(x) = x^3 - 6x^2 + nx + 2$ and $P(2) = 3P(-1)$, obtain the value of n .
- d. If $Q(x) = -x^2 + bx + c$ and $Q(0) = 5$ and $Q(5) = 0$, obtain the values of b and c .
7. Solve the following equations for x .
- a. $(x + 4)(x - 3)(x + 5) = 0$
 - b. $2(x - 7)(3x + 5)(x - 9) = 0$
 - c. $x^3 - 13x^2 + 34x + 48 = 0$
 - d. $2x^3 + 7x^2 = 9$
3. **MC** A solution of $x^3 - 9x^2 + 15x + 25 = 0$ is $x = 5$. How many other (distinct) solution are there?
- A.** 0 **B.** 1 **C.** 2 **D.** 3