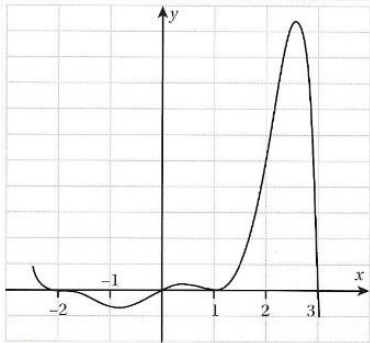


Q1. Factorise $45a^2 - 20$	Q2. Show that $(2x - 3)$ is a factor of $2x^3 - 5x^2 + x + 3$.
Q3. Factorise $3x^2 - 27y^2$	Q4. Factorise $5x^3 + 40y^3$
Q5. Simplify $\frac{x^2 + 4}{x^2 - 4} - \frac{x}{x + 2}$	Q6. Simplify $\frac{5}{x^2 - 3x - 10} - \frac{3}{x + 2}$
Q7. Simplify $\frac{x^2 - 2x - 15}{x + 5} \div \frac{x^2 - 9x + 20}{3x + 15}$	Q8. Simplify $\frac{x^2 - 36}{5x - 10} \times \frac{x - 2}{x + 6}$
Q9. Factorise $x^4 - y^4$	Q10. Show that $(x - 2)$ is a factor of $x^3 - 5x^2 + 8x - 4$ and find the other two factors.
Q11. Simplify $\frac{4x + 6}{x^2 + 2x - 35} \times \frac{x - 5}{2x + 3}$	Q12. Solve the equation below: $\frac{1}{x + 1} + \frac{1}{x} = \frac{5}{6}$
Q13. Solve the equations below: $3p + 4q - 2r = 8$ $9p + 8q + 2r = -13$ $6p - 12q + 14r = -59$	Q14. Solve the equations $x - 4y = -13$ and $x^2 + 2y^2 + 6xy = 29$.
Q15. Solve $x^3 + 5x^2 - 4x - 20 = 0$.	Q16. Form the quadratic equation with roots $\frac{5}{2}, -3$
Q17. The graph of the polynomial $y = f(x)$ of degree 7 is shown below. 	Q18. Sketch a rough graph of the polynomial $f(x) = 2(x + 2)^3x^2(x - 2)^2$.
Find an expression for the polynomial $f(x)$.	Q19. If $x^2 + ax + 4$ is a factor of $x^3 + px^2 + qx + 4b$, show that $p = a + b$ and $q = 4 + ab$.
Q22. Determine the values of $k \in R$ for which the quadratic equation $x^2 - (3k + 1)x + (2k^2 + k + 4) = 0$ has real roots.	Q20. Find the real numbers a and b such that $x^2 + 4x - 6 = (x + a)^2 + b$.
Q24. Prove that if $a > 0$ and $b > 0$ then: $(a + b)\left(\frac{1}{a} + \frac{1}{b}\right) \geq 4$	Q21. If $f(x) = 3x^3 + mx^2 - 17x + n$ and $x - 3$ and $x + 2$ are factors of $f(x)$, find the values of m and n .
Q26. Solve the inequality $\frac{x + 3}{2x - 1} \leq 4$, for $x \in R, x \neq \frac{1}{2}$.	Q23. Solve the equation $ 2x - 1 = 7$ for $x \in R$.
Q28. Solve the equation $ 3x - 1 = 5x - 7 $ for $x \in R$.	Q25. Show that the equation $4ax^2 - 4ax + a + c^2 = 0$ has no real roots for $a \in N, c \in R, c \neq 0$.
Q30. Solve the equation: $\sqrt{6x + 4} - 1 = \sqrt{3x + 1}$.	Q27. Prove that for any real numbers p and q : (i) $p^2 + 4q^2 \geq 4pq$ (ii) $(p + q)^2 \leq 2(p^2 + q^2)$
	Q29. Solve the equation: $\sqrt{2x + 5} - x = 1$.

Answers:

Q1. $5(3a - 2)(3a + 2)$	Q3. $3(x - 3y)(x + 3y)$
Q4. $5(x + 2y)(x^2 - 2xy + 4y^2)$	Q5. $\frac{2}{x - 2}$
Q6. $\frac{20 - 3x}{(x + 2)(x - 5)}$	Q7. $\frac{3x + 9}{x - 4}$
Q8. $\frac{x - 6}{5}$	Q9. $(x - y)(x + y)(x^2 + y^2)$
Q10. $(x - 2)$ and $(x - 1)$	Q11. $\frac{2}{x + 7}$
Q12. $x = -\frac{3}{5}$ or $x = 2$	Q13. $p = \frac{1}{3}, q = -\frac{3}{4}, r = -5$
Q14. $(\frac{1}{3}, \frac{10}{3}), (-9, 1)$	Q15. 2, -2 and -5
Q16. $2x^2 + x - 15 = 0$	Q17. $f(x) = -(x + 2)^3x(x - 1)^2(x - 3)$
Q20. $a = 2, b = -10$	Q21. $m = -4, n = 6$
Q22. $k \leq -5$ and $k \geq 3$	Q23. $x = -3$ or $x = 4$
Q26. $x \leq 0.5$ and $x \geq 1$	Q28. $x = 1$ or $x = 3$
Q29. $x = 2$	Q30. $x = 0$