

MTH 138 Practice Quiz on Polynomials

- (1) Sketch the graph of the polynomial function $f(x) = (x - 3)(x + 1)^2$.

- (2) Using the same function $f(x) = (x - 3)(x + 1)^2$ in (1), what is the solution to $f(x) \geq 0$?

- (3) If $f(x) = 3x^3 - kx^2 + x - 5k$, find the number k such that the graph of $f(x)$ contains the point $(-1, 4)$.

- (4) Find the quotient and remainder if $4x^3 + 2x^2 + 4$ is divided by $2x^2 + 1$.

- (5) What is the remainder when $4x^{2009} - 5$ is divided by $x - 1$?

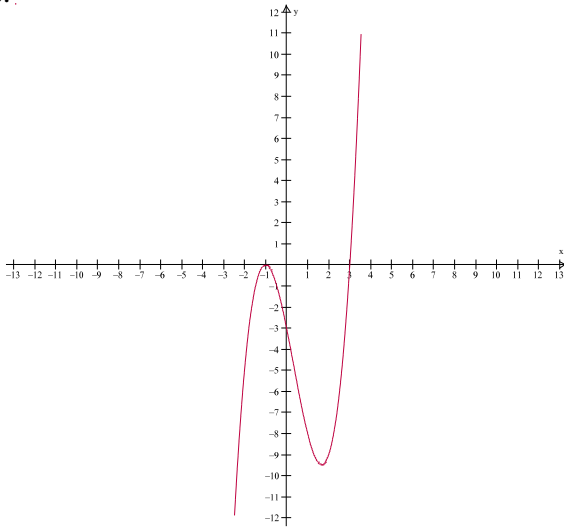
(6) Find the number k such that $x - 2$ is a factor of $x^7 - 2x^6 + x^5 + k$.

(7) Find the zeros of $f(x) = (x - 3)(x + 1)^2(x - 4)$ and state the multiplicity of each zero.

(8) Find a polynomial $f(x)$ of degree 4 such that both -3 and 2 are zeros of multiplicity 2 and $f(1) = 5$.

Answers.

(1)



(2) $\{-1\} \cup [3, -\infty)$

(3) $-\frac{4}{3}$

(4) Quotient = $2x + 1$; Remainder = $-2x + 3$

(5) -1

(6) -32

(7) $x = 3$ (multiplicity = 1), $x = -1$ (multiplicity = 2), $x = 4$ (multiplicity = 1)

(8) $f(x) = \frac{5}{16}(x+3)^2(x-2)^2$