

Quiz #9 Solutions

Problem 1.

- (1) $A = BQ + R$ where $Q = x^2 - 4x + 9$ and $R = -16$.
- (2) $A(-2) = R(-2) = -16$, since $B(-2) = 0$. It is easy to check that $A(-2) = -16$ directly.

Problem 2.

- (1) $\alpha = 2$ is a root of P .
- (2) $P = (x - 2)(x^2 + x - 6) = (x - 2)(x - 2)(x + 3)$.
- (3) Since \mathbb{R} is an integral domain, we derive from the previous question that $P(x) = 0$ if and only if $x - 2 = 0$ or $x + 3 = 0$. The roots of P are 2 and -3 .

Problem 3.

It is easy to check that $[0]$, $[1]$ and $[2]$ are all roots of P . P is not the zero polynomial, even though the associated polynomial function is the zero function.