

Math 614 Quiz 6

COMPUTE EACH INTEGER, OR EXPLAIN WHY IT CAN NOT BE DETERMINED WITH THE GIVEN INFORMATION.

- (1) The cardinality of $\text{Mor}(\mathbb{Z}/5\mathbb{Z}, \mathbb{Z} \oplus \mathbb{Z}/7\mathbb{Z} \oplus \mathbb{Z}/\mathbb{Z}5)$ in the category of \mathbb{Z} -modules.
- (2) The Krull dimension of the ring $\mathbb{Q}[x, y, z]_P$ where P is the prime ideal generated by $\langle y^2 - xz \rangle$.
- (3) The maximal height of a minimal prime of the ideal $\langle wx, wy, wz, w^2 \rangle$ in the ring $\mathbb{Q}[x, y, z, w]$.
- (4) The Krull dimension of $\mathbb{Z}_{\langle p \rangle}[x]/P$ where $P = \langle px - 1 \rangle$.
- (5) The Krull dimension of the \mathbb{C} -subalgebra of $\mathbb{C}(x, y, z)$ generated by $\frac{1}{x}, \frac{1}{x-i}, \frac{1}{x^2+2}$.
- (6) The number of minimal primes of the ring $\mathbb{F}_2[x, y, z, w]/\langle xy^2, x^3z, w^2y + xy \rangle$.
- (7) The height of the maximal ideal $\langle x^2 + 1, y^2 + 5 \rangle$ in the ring $\mathbb{R}[x, y]$.
- (8) The dimension of a K -algebra R that is a domain with fraction field $K(x, y, z)$.