FILL IN THE BLANK RING REVIEW

Fill in the blanks. Be sure to choose the most general/strongest correct answer when more than one correct answer is possible.

- The kernel of a ring homomorphism is a(n) _____.
- The image of a ring homomorphism is a(n) _____.
- Use the candidates below to fill in the following:
  _____ $\Longrightarrow$ _____ $\Longrightarrow$ _____ $\Longrightarrow$ _____ $\Longrightarrow$ _____.
  - domain
  - Euclidean domain
  - field
  - PID
  - UFD
- In a ring, unit _____ zerodivisor.
- A commutative ring has (exact) division by nonzero elements if it is a _____.
- A commutative ring has cancellation by nonzero elements if it is a _____.
- A commutative ring has division with remainder by nonzero elements if it is a _____.
- In[1] a commutative ring, $(a) \subseteq (b) \Longleftrightarrow$ _____.
- In[2] a commutative ring, $(a) = (b) \Longleftrightarrow$ _____.
- In[2] a _____, $(a) = (b) \Longleftrightarrow$ _____.
- In a _____, GCDs exist.
- In a _____, the GCD of two elements is a linear combination of them.
- In a _____, GCDs are unique _____.
- In a _____, maximal ideal $\Longrightarrow$ prime ideal.
- In a _____, (nonzero) prime ideal $\Longrightarrow$ maximal ideal.
- In a commutative ring R, I is a maximal ideal $\Longleftrightarrow$ R/I _____.
- In a commutative ring R, I is a prime ideal $\Longleftrightarrow$ R/I _____.
- In a _____, prime element $\Longrightarrow$ irreducible element.
- In a _____, irreducible element $\Longrightarrow$ prime element.

[1] Express in terms of divides.

[2] Express in terms of a word.