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:
  _________ $\implies$ _________ $\implies$ _________ $\implies$ _________ $\implies$ _________.
  - 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, $(a) \subseteq (b) \iff$ ________.
- In[1] a commutative ring, $(a) = (b) \iff$ ________.
- In[2] a _______, $(a) = (b) \iff$ _______.
- 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 $\implies$ prime ideal.
- In a _______, (nonzero) prime ideal $\implies$ maximal ideal.
- In a commutative ring R, I is a maximal ideal $\iff R/I$ ___________.
- In a commutative ring R, I is a prime ideal $\iff R/I$ ___________.
- In a _______, prime element $\implies$ irreducible element.
- In a _______, irreducible element $\implies$ prime element.

[1] Express in terms of divides.
[2] Express in terms of a word.