Hints for 2.2 # 15:

For proving reflexive, symmetric, transitive.

Naming things well is a really useful thing to do. I think it will help you if you not only name the integers, but also name the prime divisors. For example if you are proving something about an integer and you call it *x*, then you could use x_p is the name of it's largest prime divisor (you could also use p_x or p(x) as notation for that—just so long as you have a consistent notation), and when you're proving the symmetric property, you could have integers *a* and *b* and you can name their largest prime factors a_p and b_p.

If you always use x_p as your notation for the largest prime factor of x, you could rewrite the definition of the relation to be xRy means $x_p = y_p$

Hints for 2.2 # 16:

First you need to know what this is saying. Here are some examples:

A={3, 4, 5} is equivalent to B={2, 3, 5} and C={3, 5} because

$\{3,4,5\} \cap \{1,3,5\} = \{3,5\}$ and $\{2,3,5\} \cap \{1,3,5\} = \{3,5\}$ and $\{3,5\} \cap \{1,3,5\} = \{3,5\}$ (all of the intersections with {1,3,5} are the same)

That means that all of these exist: ARA, ARB, ARC, BRA, BRB, BRC, CRA, CRB, CRC.

But A is not equivalent to $\{1,3,4\}$ or $\{2,3,4\}$ because

$\{1,3,4\} \cap \{1,3,5\} = \{1,3\}$ and $\{2,3,4\} \cap \{1,3,5\} = \{3\}$ (the intersections is {1,3,5} are not the same as the intersections $A \cap \{1,3,5\} = \{3,4,5\} \cap \{1,3,5\} = \{3,5\}$)

Now the suggestions: Notation will also help you here. You could give a name to the special set $\{1,3,5\}$, so if you called that T, you could say that ARB means $A \cap T = B \cap T$. Another idea would be to name separately the intersection with each set, so when you named the set X you could also give a name to the intersection of X with $\{1,3,5\}$ (maybe you could call it Xi (I for intersection)).