Re: Three quesition about graph coloring

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- *Date*: 28 Feb 2006 23:55:12 −0800

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milochen wrote:

> I am sorry about that I forget that some symbol couldn't use here.
>
> so,I repost about my question.
>
> X(G):= chromatic number of simple graph G
> A ^S^ B:= the intersection of A and B
> A vSv B:= the union of A and B
>
> Define a function CLRS: {graphs} −> { sets of function(s)}
> s.t. G |−> {f | f:V(G)−>{1,2,...,X(G)} is proper coloring}
>
> Suppose G, H be any simple graph...
> Is "CLRS(G)=CLRS(H) <−> G is isomophic to H " ?

If V(G) is not equal to V(H), then CLRS(G) cannot equal CLRS(H); in fact, they are disjoint. (CLRS(G) contains functions with domain V(G), and CLRS(H) contains functions with domain V(H).)

So let's assume V(G) = V(H); then CLRS(G) = CLRS(H) looks equivalent.

> Is always exist simple graph F s.t. CLRS(F)=CLRS(G) ^S^ CLRS(H)?

F = G union H ? (V(F) := V(G) = V(H), E(F) = E(G) union E(H).) This shouldn't be too difficult to prove.

> Is always exist simple graph F s.t. CLRS(F)=CLRS(G) vSv CLRS(H)?

Well, F = G intersected H doesn't work, even if n=3. Let V(G) = V(H) = {1,2,3}, and G has edge (1,2), and H edge (1,3). Then the coloring c = (1,1,1) is in CLRS(F) but not in CLRS(F) or CLRS(G). The answer to this might be NO, and these graphs G and H might provide a counterexample.

> At first, I never know the discussion for set of coloring.
> I just get the idea, but I'm not ensure whether it's good or bad.
> I just get a new thinking about this.
>
> Is any book ever talk about something like this?

Not any that I know of right away. Usually colorings are only
considered for one graph.

−−− Christopher Heckman

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