Step 1. It makes little difference where one begins to solve this kind of problem, so we shall begin at the top. The *Gr–Rc* distance is 25 map units, and the *Gr–S* distance is 1 unit. Therefore, the relationship of these three genes may be either

(*a*) *S*(1)*Gr* (25) *Rc*

or

(*b*) *Gr*(1)*S* (24) *Rc*

The table, however, tells us that the distance *S–Rc* is 26 units. Therefore, alternative (*a*) must be correct, i.e., *Gr* is between *S* and *Rc*.

Step 2. The *Gr–Y* distance is 19 units. Again, two alternatives are possible:

(*c*) *S*(1)*Gr* (19) *Y* (6) *Rc*

or

(*d*) *Y* (18) *S*(1)*Gr* (25) *Rc*

In the table we find that the distance *Y–Rc* = 6. Hence, possibility (*c*) must be correct, i.e., *Y* lies between the loci of *Gr* and *Rc*.

Step 3. The distance *Gr–P* is 7 map units. Two alternatives for these loci are

(*e*) *S*(1)*Gr* (7) *P* (12) *Y* (6) *Rc*

or

(*f*) *P* (6) *S*(1)*Gr* (19) *Y* (6) *Rc*

The distance *P–S* is read from the table, and thus alternative (*f*) must be correct.

Step 4. There are 20 units between *Gr* and *oa.* These two genes may be in one of two possible relationships:

(*g*) *P* (6) *S*(1)*Gr* (19) *Y*(1)*oa* (5) *Rc*

or

(*h*) *oa* (13) *P* (6) *S*(1)*Gr* (19) *Y* (6) *Rc*

The table indicates that *Y* and *oa* are 1 map unit apart. Therefore, (*g*) is the completed map.