These signs should have exactly the same spacing around them:

a = b

 $a \equiv b$

a < b

 $a \approx b$

 $a \lesssim b$

 $a \leq b$

 $a \ge b$

These signs should have exactly the same spacing around them:

 $a \neg b$

a \vdash b

 $a \wedge b$

 $a \times b$

a + b