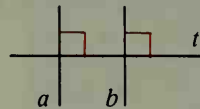


10. Arrange sentences (a)–(e) in an order that completes an indirect proof of the following statement: In a plane, two lines perpendicular to a third line are parallel to each other.

Given: Lines a , b , and t lie in a plane;

$$a \perp t; b \perp t$$

Prove: $a \parallel b$



- Then a intersects b in some point Z .
- But this contradicts the theorem which says that there is exactly one line perpendicular to a given line through a point outside the line.
- It is false that a is not parallel to b , and it follows that $a \parallel b$.
- Assume temporarily that a is not parallel to b .
- Then there are two lines through Z and perpendicular to t .

Written Exercises

Suppose someone plans to write an indirect proof of each conditional. Write a correct first sentence of the indirect proof.

- A**
- If $m\angle A = 50$, then $m\angle B = 40$.
 - If $\overline{DF} \not\cong \overline{RT}$, then $\overline{DE} \not\cong \overline{RS}$.
 - If $a \neq b$, then $a - b \neq 0$.
 - If $x^2 \neq y^2$, then $x \neq y$.
 - If $\overline{EF} \not\cong \overline{GH}$, then \overleftrightarrow{EF} and \overleftrightarrow{GH} aren't parallel.

Write an indirect proof in paragraph form.

- Given: People wearing coats are shivering as they come to the door.
Prove: It's cold outside.
- Given: $\triangle XYZ$; $m\angle X = 100$
Prove: $\angle Y$ is not a rt. \angle .
- Given: n is an integer and n^2 is odd.
Prove: n is odd.
- Given: Transversal t cuts lines a and b ;
 $m\angle 1 \neq m\angle 2$
Prove: $a \not\parallel b$
- Given: $\overline{OJ} \cong \overline{OK}$; $\overline{JE} \not\cong \overline{KE}$
Prove: \overrightarrow{OE} doesn't bisect $\angle JOK$.

