

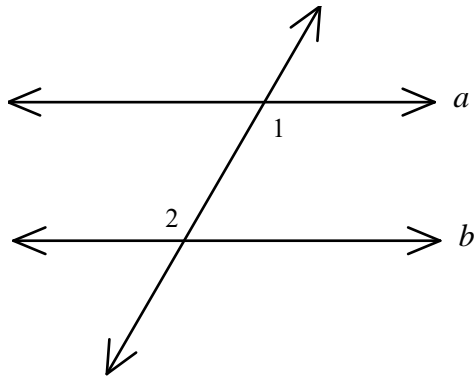
NAME: _____

1. Write an indirect proof to show that $\sqrt{18} \neq 3\sqrt{6}$.

2. Write an indirect proof.

Given: $m\angle 1 = 126$ and $m\angle 2 = 125$

Prove: $a \nparallel b$



3. Given points $A(2, 3)$ and $B(-2, 5)$, explain how you would use an indirect argument to show that point $C(0, 3)$ is *not* the midpoint of \overline{AB} .

4. Use an indirect proof to show that two rectangular prisms with congruent bases but different heights do not have the same volume.

5. Write a paragraph outlining the steps involved in using indirect proof.

Suppose that $\sqrt{18} = 3\sqrt{6}$, then $(\sqrt{18})^2 = (3\sqrt{6})^2$. This result $18 = 54$ is false,

[1] so the assumption is false; thus $\sqrt{18} \neq 3\sqrt{6}$.

Assume $a \parallel b$. If two parallel lines are cut by a transversal, then alternate interior angles are congruent. This contradicts the given information since $m\angle 1 \neq m\angle 2$. The assumption that $a \parallel b$ is false. Thus

[2] $a \not\parallel b$.

Assume C is the midpoint and that $AC = BC$. Determine AC and BC . If $AC \neq BC$, then that contradicts the assumption, so C is not the midpoint.

[3]

Assume they do have the same volume and let the two prisms have length, width, and height a, b, c and d, e, f , respectively. Then $V_1 = V_2$, so $abc = def$. But $ab = de$ because the bases are congruent, which

[4] implies $c = f$, a contradiction. So, the prisms do not have the same volume.

You must assume that the opposite of what you want to prove is true. Then you must use logical reasoning to reach a contradiction of an earlier statement. Then state that the assumption you made was

[5] false. Then you must state that what you wanted to prove must be true.
