

Name

10-5 Lesson Master

Questions on SPUR Objectives
See Student Edition pages 673–677 for objectives.

SKILLS

Objective C

In 1–3, let $\vec{u} = \langle 16, 2 \rangle$ and $\vec{v} = \langle -4, 7 \rangle$. Find each vector in component form.

1. $\vec{u} + \vec{v}$
2. $\vec{u} - \vec{v}$
3. $-\vec{u}$

In 4–6, let $\vec{u} = [5, 30^\circ]$ and $\vec{v} = [2, 135^\circ]$. Find each vector in polar form.

4. $\vec{u} + \vec{v}$
5. $\vec{u} - \vec{v}$
6. $-\vec{u}$

PROPERTIES

Objective E

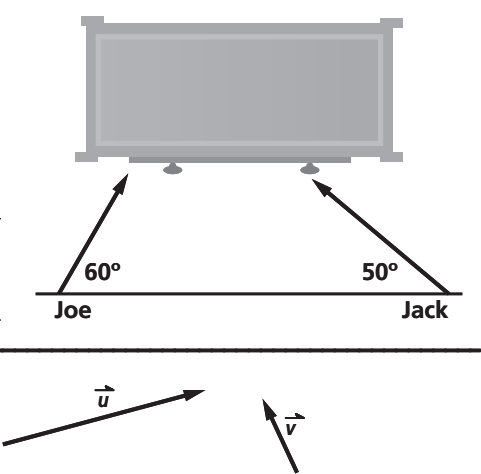
7. Prove that vector addition is commutative; that is, prove that for all vectors \vec{u} and \vec{v} , $\vec{u} + \vec{v} = \vec{v} + \vec{u}$.

USES

Objective H

8. The instrument panel on an airplane indicates that the plane is flying at 270 mph in a direction 30° west of south. There is a wind blowing from the northeast at 30 mph.
- a. Find vectors in polar form to represent the direction and speed of the plane (relative to still air) and the wind.
- b. Add the vectors in Part a, and explain what the resultant vector means for the plane.

9. Twin brothers Jack and Joe share a room with their older brother Jim. They are trying to push Jim’s dresser back onto his side of the room. Jack applies 32 lb of force and Joe applies 26 lb of force in the directions shown.
- a. Find the magnitude and direction of the force the twins apply together.
- b. Find a vector for the force Jim must apply to keep the dresser stationary.



REPRESENTATIONS

Objective M

In 10–12, use the vectors \vec{u} and \vec{v} at the right.

10. Sketch $-\vec{u}$.
11. Sketch a diagram showing how to find $\vec{u} + \vec{v}$.
12. Sketch a diagram showing how to find $\vec{u} - \vec{v}$.