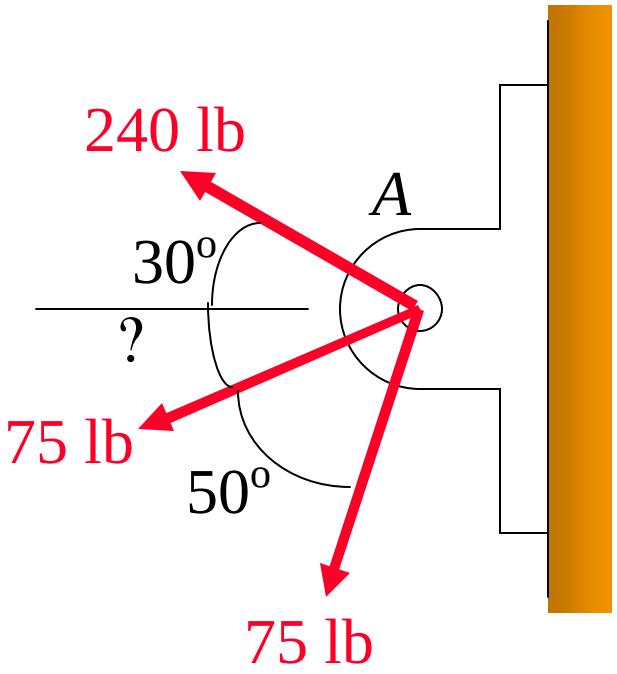
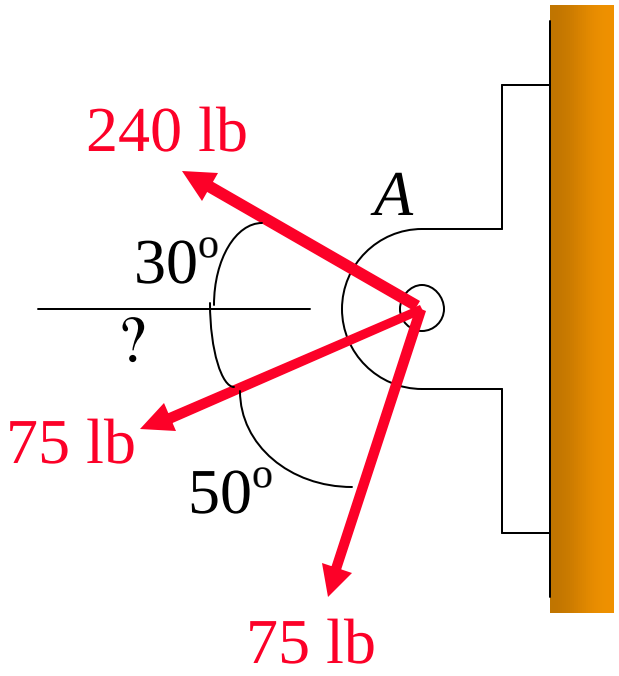
Problem 2.129



The direction of the 75-lb forces may vary, but the angle between the forces is always 50°. Determine the value of ? for which the resultant of the forces acting at *A* is directed horizontally to the left.

Problem 2.129

Solving Problems on Your Own



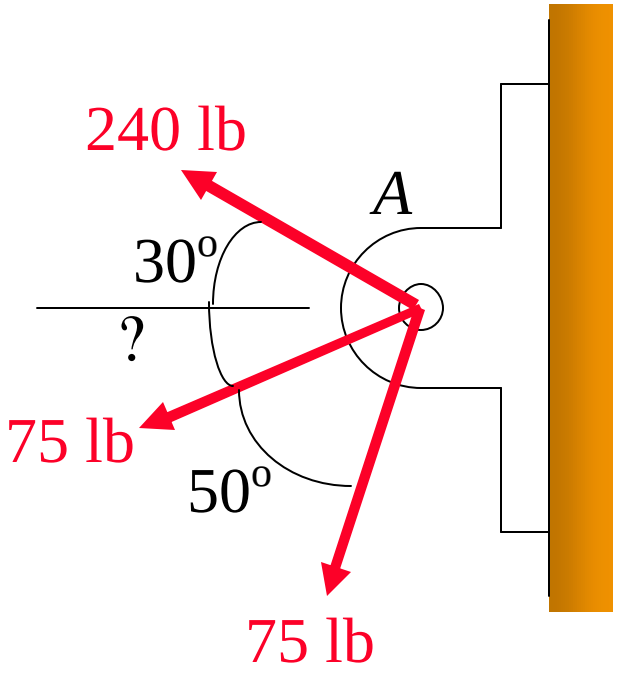
The direction of the 75-lb forces may vary, but the angle between the forces is always 50°. Determine the value of ? for which the resultant of the forces acting at *A* is directed horizontally to the left.

1. *Determine the resultant* **R** *of two or more forces*.

2. *Draw a parallelogram with the applied forces as two adjacent sides and the resultant as the included diagonal.*

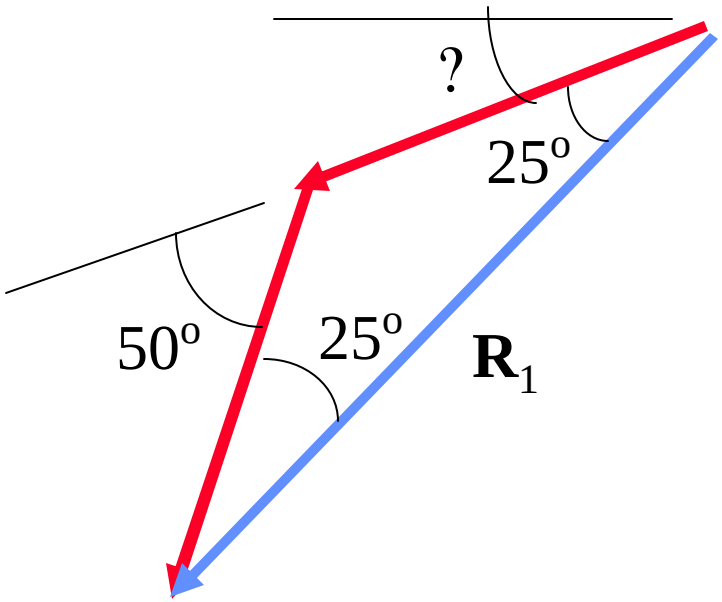
3. *Set the resultant, or sum of the forces, directed horizontally.*

Problem 2.129 Solution



*Determine the resultant **R** of two or more forces.*

We first Replace the two 75-lb forces by their resultant $\mathbf{R}_1$, using the triangle rule.

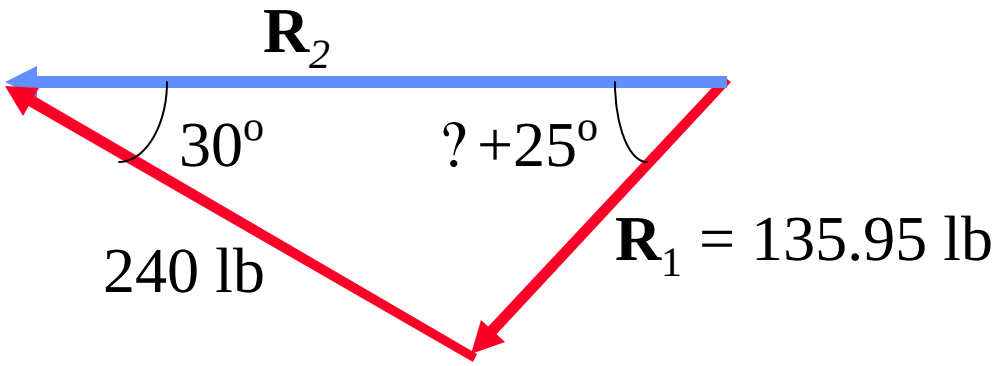


$$R_1 = 2(75\text{ lb})\cos 25^\circ = 135.95\text{ lb}$$

$$\mathbf{R}_1 = 135.95\text{ lb} \quad ? \quad +25^\circ$$

Problem 2.129 Solution

Draw a parallelogram with the applied forces as two adjacent sides and the resultant as the included diagonal.
Set the resultant, or sum of the forces, directed horizontally.



Consider the resultant $\mathbf{R}_2$ of $\mathbf{R}_1$ and the 240-lb force and recall that $\mathbf{R}_2$ must be horizontal and directed to the left.

Law of sines:

$$\frac{\sin(?+25^\circ)}{240\text{ lb}} = \frac{\sin(30^\circ)}{135.95\text{ lb}}$$

$$? + 25^\circ = 61.97^\circ$$

$$\sin(?+25^\circ) = \frac{(240\text{ lb})\sin(30^\circ)}{135.95\text{ lb}} = 0.88270$$

$$? = 37.0^\circ$$