Resolving Forces #1

1. An object has three forces acting on it, a 15 N force and a 10 N force pushing to the right, and a 20 N force pushing to the left, as shown in the diagram below.

What is the net force (magnitude and direction) on the object?

5 N right

2. A stationary block has three forces acting on it: a 20 N force to the right, a 15 N force downwards, and a third force, \( \vec{R} \) of unknown magnitude and direction, as shown in the following diagram:

Find the magnitude and direction of \( \vec{R} \).

25 N

+37°
3. Three forces act on an object. One force is 10 N to the right, one force is 3.0 N downwards, and one force is 12 N at an angle of 30° above the horizontal, as shown in the diagram below.

\[
\begin{align*}
10 \text{ N} & \quad & 12 \text{ N} \\
& & 3 \text{ N}
\end{align*}
\]

What is net force (magnitude and direction) on the object? (Hint: resolve the forces into a vertical component and a horizontal component, then find the resultant of the two.)

20.6 N

\[+8.4°\]

4. A force of 3.7 N horizontally and a force of 5.9 N at an angle of 43° act on a 4.5-kg block that is resting on a frictionless surface, as shown in the following diagram:

\[
\begin{align*}
3.7 \text{ N} & \quad & 5.9 \text{ N}
\end{align*}
\]

What is the magnitude of the horizontal acceleration of the block?

\[1.8 \text{ m/s}^2\]