

Name _____

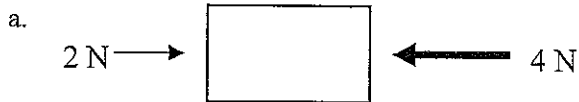
Net Force Worksheet

What causes objects to move? For each problem, complete the questions using your Forces reading and vocabulary chart in your science notebook.

1. Write the definition of each term in the definition column. Then decide whether that force produces motion and write either yes, no or it depends in the motion column.

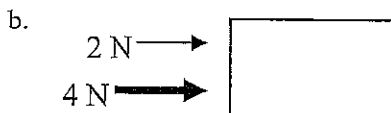
Vocabulary term	Definition	Change in motion? (yes, no or it depends)
Net force		
Balanced forces		
Unbalanced forces		

2. For each of diagram, determine the net force acting on the object. Follow the format for showing your work shown in (a). Then, write whether or not there will be a change in motion. If yes, write the direction the object will move in.



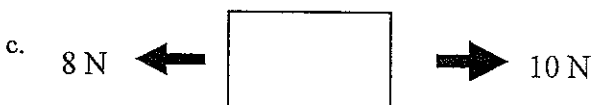
Net force: $4\text{ N} - 2\text{ N} = 2\text{ N}$ to the left.

Change in motion: The box will move to the left.



Net force:

Change in motion:



Net force:

Change in motion:

d.



Net force:

Change in motion:

e.



Net force:

Change in motion:

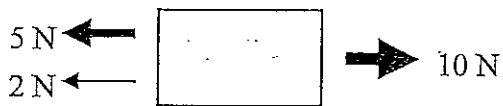
f.



Net force:

Change in motion:

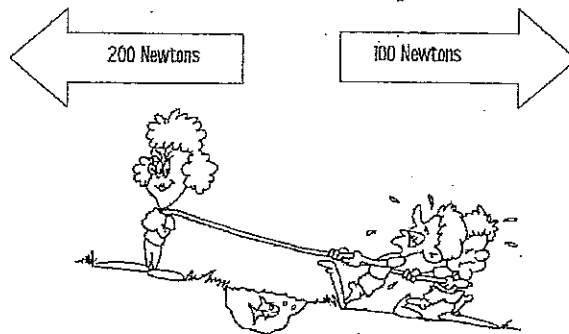
g.



Net force:

Change in motion:

3. Below is a diagram of a tug-a0war. Circle the correct word to complete the sentences that follow.



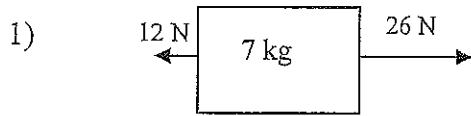
- The forces shown are PUSHING/ PULLING forces.
- The forces shown are acting in the SAME DIRECTION/ OPPOSITE DIRECTIONS.
- The forces are EQUAL/ NOT EQUAL.
- The forces are BALANCED/ UNBALANCED..
- Motion is to the RIGHT/ LEFT.

Calculating Net Forces

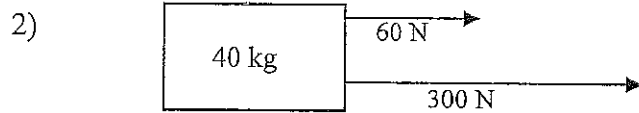
Interpret each drawing of forces on the box. Calculate and write the resulting net force on the blank below the box (make sure to include the correct unit of measure). On the next blank, write the word balanced or unbalanced and circle the arrow for the direction of the resulting net force.

<p>1.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">100 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">50 N ←</div> <div style="margin-bottom: 5px;">75 N ←</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>	<p>2.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">545 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">732 N ←</div> <div style="margin-bottom: 5px;">545 N ←</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>
<p>3.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">61 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">61 N ←</div> <div style="margin-bottom: 5px;">192 N →</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>	<p>4.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">1231 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">489 N ←</div> <div style="margin-bottom: 5px;">956 N ←</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>
<p>5.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">653 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">1000 N ←</div> <div style="margin-bottom: 5px;">352 N →</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>	<p>6.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">8732 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>
<p>7.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">577 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">2957 N ←</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>	<p>8.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">83 N →</div> <div style="border: 1px solid black; width: 60px; height: 60px; margin-right: 20px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">96 N ←</div> </div> </div> <p>Net Force _____</p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center; margin-right: 10px;">→</div> <div style="flex: 1; border-bottom: 1px solid black; margin-right: 10px;"></div> <div style="display: flex; align-items: center; justify-content: center;">←</div> </div>

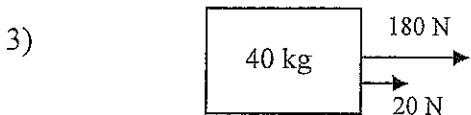
For each of the following problems, give the net force on the block, and the acceleration, including units.



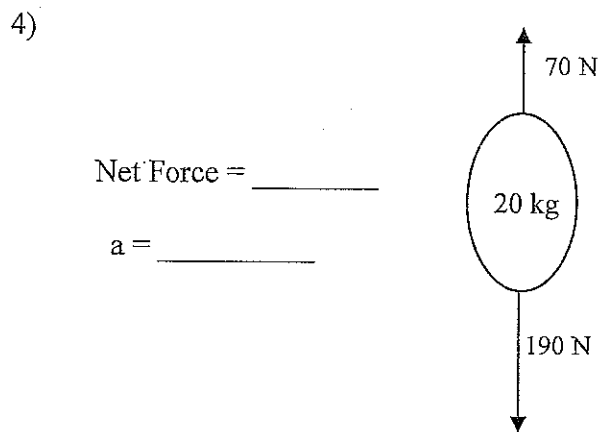
Net Force = _____ $a = F/m =$ _____



Net Force = _____ $a = F/m =$ _____

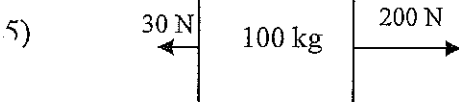


Net Force = _____ $a =$ _____



Net Force = _____

$a =$ _____

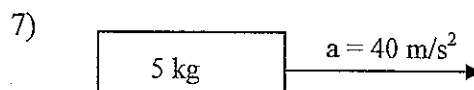


Net Force = _____ $a =$ _____

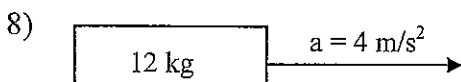
For problems 6-9, using the formula net Force = Mass • Acceleration, calculate the net force on the object.



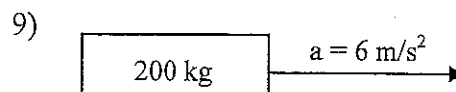
$F = m \cdot a =$ _____



$F = m \cdot a =$ _____



$F = m \cdot a =$ _____



$F = m \cdot a =$ _____

10) Challenge: A student is pushing a 50 kg cart, with a force of 600 N. Another student measures the speed of the cart, and finds that the cart is only accelerating at 3 m/s^2 . How much friction must be acting on the cart? Hint: Draw a diagram showing the cart, and the two forces acting on it.

