

In most cases there is more than one force acting upon an object. These forces can act in different directions and may even cancel each other out.

The over-all force (Resultant) on an object can be calculated by adding up all the forces in one direction and comparing this to the forces in the opposite direction. Add forces in the same direction and subtract (take-away) forces in opposite directions.

Examples : What is the resultant force on the box ?

1     $6\text{ N (to the right)} + 12\text{ N (to the right)}$   
        $= \underline{18\text{ N}}$  (to the right)



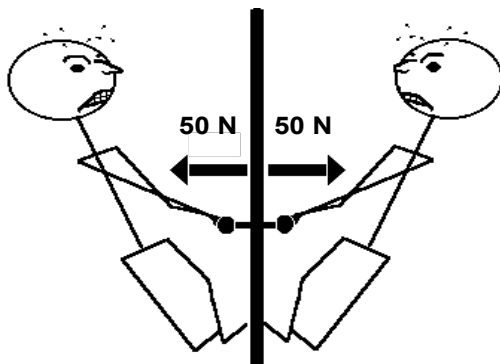
The resultant force will be in the direction of the biggest force. If the biggest force is to the right then the resultant force will be to the right. If the biggest force is to the left then the resultant force will be to the left. What will happen if the forces on each side are equal ?

3     $6\text{ N (to the right)} - 6\text{ N (to the left)}$   
        $= \underline{0\text{ N}}$

A zero resultant force means there is no over-all force (in either direction).

Calculate the resultant forces in the following situations. Which way will the object move ?

4




---

Make sure all workings are clearly shown.

---



Force D is put on the rope to try to lift the bucket of sand, Force E is due to the weight of the bucket. What will happen if the bucket is sitting on the ground and :

- 11  $D = 150 \text{ N}$  ,  $E = 200 \text{ N}$
- 12  $D = 150 \text{ N}$  ,  $E = 130 \text{ N}$
- 13  $D = 210 \text{ N}$  ,  $E = 210 \text{ N}$
- 14  $D = 350 \text{ N}$  ,  $E = 200 \text{ N}$

If the bucket was in mid-air what would happen if :

- 15  $D = 150 \text{ N}$  ,  $E = 200 \text{ N}$
- 16  $D = 220 \text{ N}$  ,  $E = 200 \text{ N}$
- 17  $D = 110 \text{ N}$  ,  $E = 110 \text{ N}$
- 18  $D = 120 \text{ N}$  ,  $E = 130 \text{ N}$



What force would have to be applied to G to give a resultant force of 10 N to the right if :

- 22  $F = 60 \text{ N}$  and  $H = 80 \text{ N}$
- 23  $F = 30 \text{ N}$  and  $H = 42 \text{ N}$
- 24  $F = 23 \text{ N}$  and  $H = 75 \text{ N}$

---

Make sure all workings are clearly shown.

---