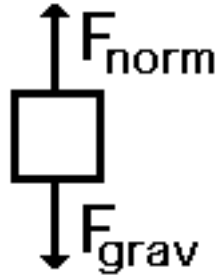


Free Body Diagram PRACTICE PROBLEMS

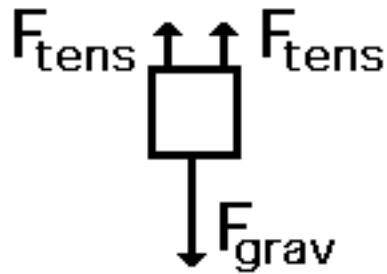
- a. A book is at rest on a tabletop. Diagram the forces acting on the book.
- b. A girl on a bar is suspended motionless from the ceiling by two ropes. Diagram the forces acting on the combination of girl and bar.
- c. An egg is free-falling from a nest in a tree. Neglect air resistance. Diagram the forces acting on the egg as it is falling.
- d. A flying squirrel is gliding (no *wing flaps*) from a tree to the ground at constant velocity. Consider air resistance. Diagram the forces acting on the squirrel.
- e. A rightward force is applied to a book in order to move it across a desk with a rightward acceleration. Consider frictional forces. Neglect air resistance. Diagram the forces acting on the book.
- f. A rightward force is applied to a book in order to move it across a desk at constant velocity. Consider frictional forces. Neglect air resistance. Diagram the forces acting on the book.
- g. A physics student rests a backpack upon his shoulder. The pack is suspended motionless by one strap from one shoulder. Diagram the vertical forces acting on the backpack.
- h. A skydiver is descending with a constant velocity. Consider air resistance. Diagram the forces acting upon the skydiver.
- i. A force is applied to the right to drag a sled across loosely packed snow with a rightward acceleration. Diagram the forces acting upon the sled.
- j. A football is moving upwards towards its peak after having been *booted* by the punter. Diagram the forces acting upon the football as it rises upward towards its peak.
- k. A car is coasting to the right and slowing down. Diagram the forces acting upon the car.

Answers

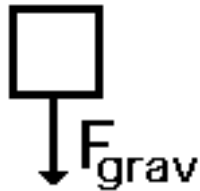
1. A book is at rest on a tabletop. A free-body diagram for this situation looks like this:



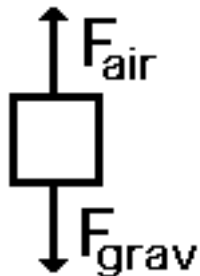
2. A girl is suspended motionless from the ceiling by two ropes. A free-body diagram for this situation looks like this:



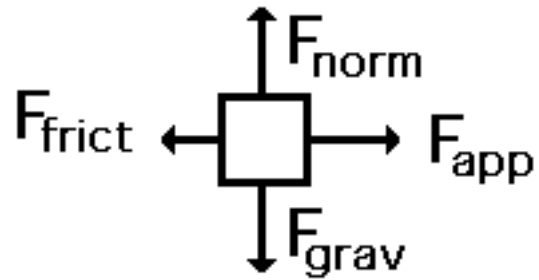
3. An egg is free-falling from a nest in a tree. Neglect air resistance. A free-body diagram for this situation looks like this:



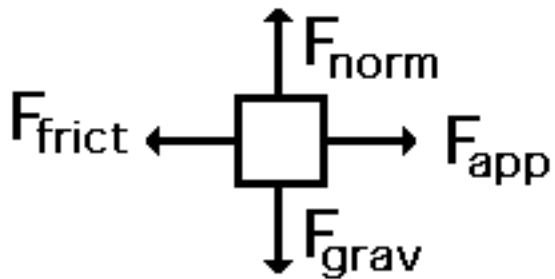
4. A flying squirrel is gliding (no *wing flaps*) from a tree to the ground at constant velocity. Consider air resistance. A free-body diagram for this situation looks like this:



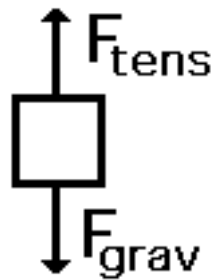
5. A rightward force is applied to a book in order to move it across a desk with a rightward acceleration. Consider frictional forces. Neglect air resistance. A free-body diagram for this situation looks like this:



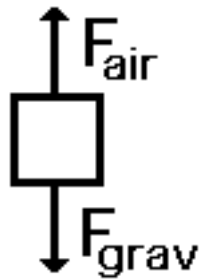
6. A rightward force is applied to a book in order to move it across a desk at constant velocity. Consider frictional forces. Neglect air resistance. A free-body diagram for this situation looks like this:



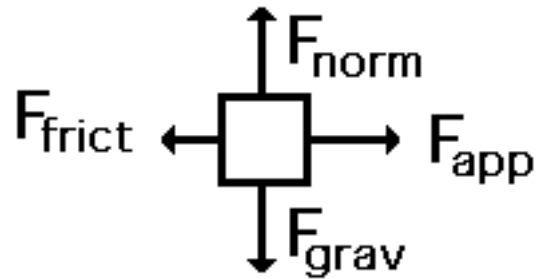
7. A physics student rests a backpack upon his shoulder. The pack is suspended motionless by one strap from one shoulder. A free-body diagram for this situation looks like this:



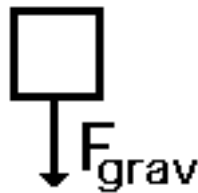
8. A skydiver is descending with a constant velocity. Consider air resistance. A free-body diagram for this situation looks like this:



9. A force is applied to the right to drag a sled across loosely packed snow with a rightward acceleration. A free-body diagram for this situation looks like this:



10. A football is moving upwards towards its peak after having been *booted* by the punter. A free-body diagram for this situation looks like this:



11. A car is coasting to the right and slowing down. A free-body diagram for this situation looks like this:

