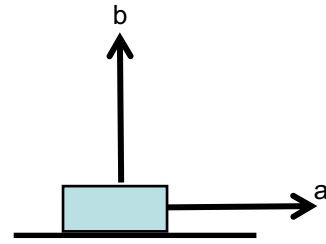


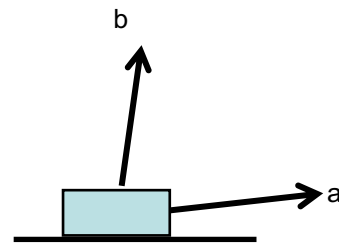
141-Worksheet. We begin working with two dimensions without any use of trigonometry because we should be able to visualize how vectors work first. Please do not try to estimate angles or use trig. Just draw pictures, and think about your experiences.

- 1) You have a 20 kg block on a frictionless surface, and can apply a 120 N force on the block by pulling on a string. Please find the acceleration when I pull the string horizontally as shown in a). Also find the normal force between the block and the frictionless surface



- 2) Now, pull vertically on the string as shown in b) Also find the normal force between the block and the frictionless surface.
- 3) For scenario b, what would the acceleration and normal force be if I pull the string with a force of 220 N?

- 4) Please repeat question #1 and #2 for the scenario at right where the direction of the pulling is no longer perfectly horizontal and vertical. It may be a good idea to visually decompose the forces into vertical and horizontal components. Do not use trig. Do not use a calculator.



- 5) How would the accelerations for questions #1, #2 and #4 above change if the surface and the block actually had a coefficient of friction of 0.2 (both for the static and dynamic)?