

Name _____

Date _____

UBF homework 1

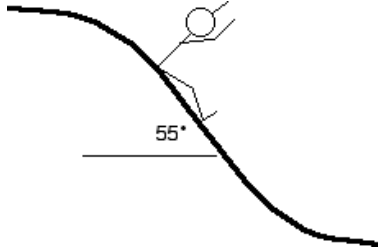
1. Draw a **qualitative** force diagram for a 900 kg car that exerts 5000 N of traction force on a level road while being opposed by 1000 Newtons of friction and drag forces combined.



- a. Are the forces in the vertical direction balanced? Explain why or why not in a complete sentence.
- b. Are the forces in the horizontal direction balanced? Explain why or why not in a complete sentence.
- c. Write an equation that relates the size of the forces in the direction where the forces are **balanced**.
- d. Write a net force equation for that relates the forces in the direction where the forces are **unbalanced**.
- e. Calculate the acceleration of the car and use your answers from above to turn your **qualitative** force diagram into a **quantitative** force diagram.

2. A child takes a trip down a slide.

- a. Draw a **qualitative** force diagram for the 30kg child. The frictional force is 160 N. (Don't forget to rotate the surface!)



- a. Are the forces in the vertical direction balanced? Explain why or why not in a complete sentence.
- b. Are the forces in the horizontal direction balanced? Explain why or why not in a complete sentence.
- c. Write an equation that relates the size of the forces in the direction where the forces are **balanced**.
- d. Write a net force equation for that relates the forces in the direction where the forces are **unbalanced**.
- e. Calculate the acceleration of the child and use your answers from above to turn your **qualitative** force diagram into a **quantitative** force diagram.