

**PROBLEM SET 66 – INDIVIDUAL WORK ONLY**

**NAME:** \_\_\_\_\_

**NUMBER** \_\_\_\_\_

1. A block slides across a rough, horizontal surface. Consider only the up-and-down direction. What is the direction of this block's *vertical* acceleration?
- (A) Up
  - (B) Down
  - (C) The vertical acceleration is zero
  - (D) The vertical acceleration cannot be determined.

Answer: \_\_\_\_\_

*Justification:*

2. A 10 kg box is given an initial push so that it slides to the left across the floor. The coefficient of friction is 0.20 and the push imparts an initial speed of 4.0 m/s.

(a) On the dot below, draw a free body diagram of the box AFTER the initial push as it slides across the floor.



(b) What is the direction of the box's acceleration?

Answer: \_\_\_\_\_

*Justification:*

(c) Is the normal force on the box...

- (A) Greater than 100 N
- (B) Less than 100 N
- (C) Equal to 100 N

Answer: \_\_\_\_\_

*Justification:*

Questions 3-5: A drag racing car speeds up from rest to 22 m/s in 2 s. The car has mass 800 kg; the driver has mass 80 kg.

**3.** Calculate the acceleration of the drag racer.

Answer: \_\_\_\_\_

*Justification with a fact:*

**4.** Calculate the net force on the drag racer.

Answer: \_\_\_\_\_

*Justification with a calculation:*

**5.** Which experiences a greater net force?

(A) The driver

(B) The car

(C) Both the driver and the car experience the same net force

Answer: \_\_\_\_\_

*Justification with either an equation or a calculation:*