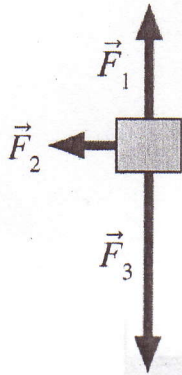


ave. = 7.3
 $\sigma = 2.4$

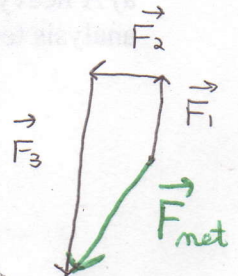
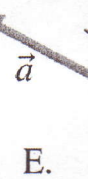
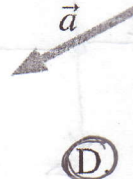
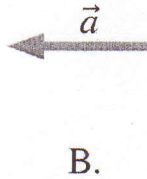
Quiz #4: Forces and Newton's Laws of Motion

Problem 1 (2 points)

Three forces act on an object. In which direction does the object accelerate?



D



acceleration is in the direction of the net force

Problem 2 (2 points)

Tennis balls experience a large drag force. A tennis ball is hit so that it goes straight up and then comes back down. The direction of the drag force is

D

- a) always up.
- b) up and then down.
- c) always down.
- d) down and then up.**

drag is always in the opposite direction of motion

Problem 3 (3 points)

A constant force is applied to an object, causing it to accelerate at 20.0 m/s^2 . What will be the acceleration if:

- a) The force is halved?

$a = \frac{1}{2} F/m = \frac{1}{2} (F/m) = 10.0 \text{ m/s}^2$

$a = F/m = 20.0 \text{ m/s}^2$

- b) The force is halved and the object's mass is doubled?

$a = \frac{1/2 F}{2m} = \frac{1}{4} (F/m) = 5.0 \text{ m/s}^2$

5.0 m/s^2

- c) The force and the object's mass are both doubled?

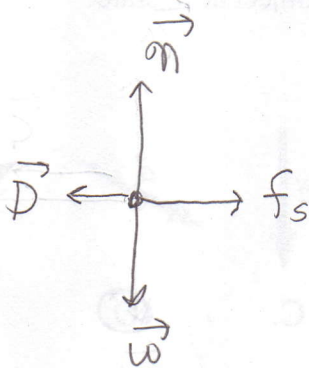
$a = \frac{2F}{2m} = F/m = 20.0 \text{ m/s}^2$

20.0 m/s^2

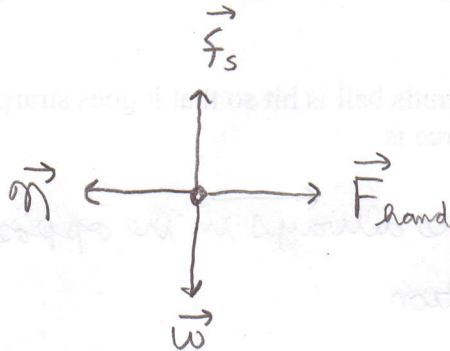
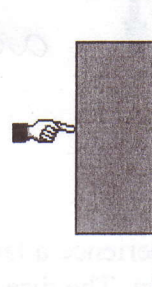
Problem 4 (3 points)

For each situation described below, draw a free-body diagram showing all of the forces acting on the object.

a) A heavy box is in the back of a truck. The truck is accelerating to the right. Apply your analysis to the box. (Air resistance is not negligible.)



b) You hold a picture motionless against a wall by pressing on it.



c) A person on a bridge throws a rock straight downward towards the water. The rock has just been released. Air resistance is negligible.

